

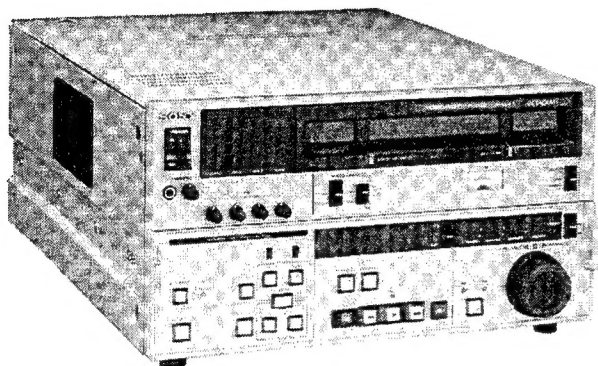


SONY - SP0105

**SONY.**

VIDEOCASSETTE PLAYER

**BVW-65P**



**BETACAM SP™**

MAINTENANCE MANUAL

Volume 1 2nd Edition (Revised 11)

Serial No. 10031 and Higher

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## Volume 2

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# SECTION 1

## INSTALLATION

Be sure to install the BVW-65P in locations satisfying the required operational environment described below to assure the BVW-65P's superior performance and to maintain the excellent serviceability and accessibility.

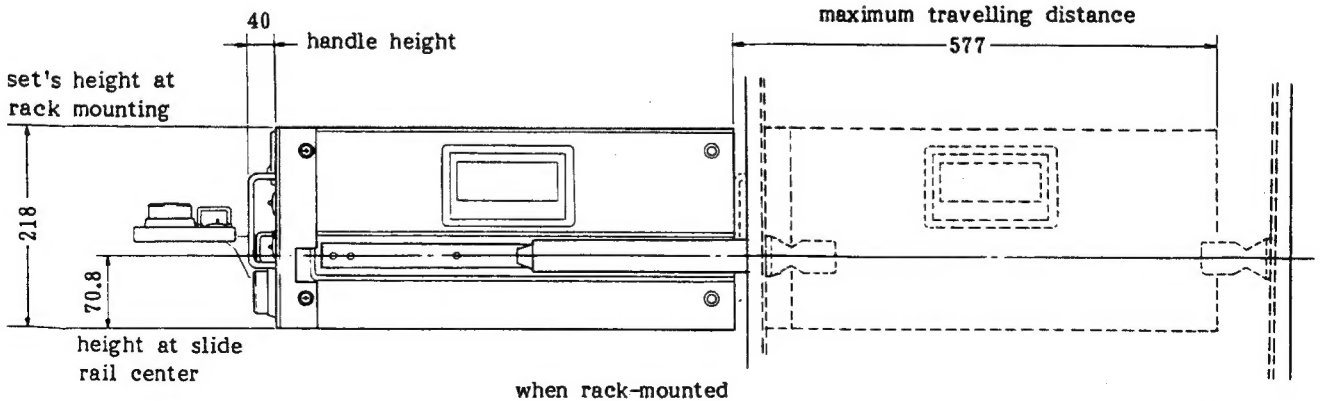
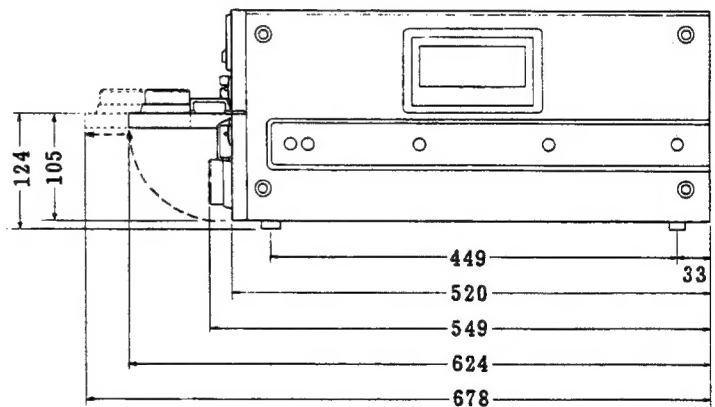
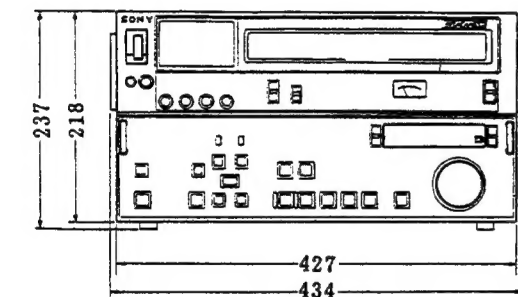
- . Dusty areas or areas where it is subject to vibration.
- . Areas with strong electric or magnetic fields.
- . Areas near heat sources.

### 1-1. OPERATIONAL ENVIRONMENT

1. Operating temperature:  
5° C to 40° C  
(Good air circulation is essential to prevent internal heat build-up. Place the unit in locations with sufficient air circulation. Do not block the ventilation holes on the cabinet and the rear panel.)
2. Storage temperature:  
-20° C to +60° C
3. Locations to avoid:  
Areas where the BVW-65P will be exposed to direct sunlight or any other strong lights.

### 1-2. INSTALLATION SPACE

1. The outer dimensions of the unit are shown in the figure below. The rear side must be at least 40 cm from the wall for ventilation and maintenance.
2. When the unit is operated on a desk or similar condition, assure that the clearance above the unit is at least 40 cm to provide accessibility to the printed circuit boards and other mechanical parts. Note that it is not necessary to provide the space when the unit is mounted in a rack since the printed circuit boards can be repaired after it is pulled out.



Unit: mm

### 1-3. OPERATING VOLTAGE

90 V to 265 V

48 Hz to 64 Hz

Power consumption : 175 W

### 1-4. CONNECTION CONNECTORS

When external cables are connected to the various connectors on the connector panel during maintenance, the hardware listed below (or equivalents) must be used.

Panel Indication	Connection Connector
VIDEO INPUT REF VIDEO	1-560-069-11 PLUG, BNC, MALE
VIDEO OUTPUT 1/2/3 COMPONENT 2 (Y, R-Y, B-Y)	1-560-069-11 PLUG, BNC, MALE
DUB/COMPONENT 1	1-560-995-00 PLUG, 12P, MALE
AUDIO OUTPUT CH-1/CH-2/CH-3/CH-4 SELECTED : CH-1/CH-3 : CH-2/CH-4	1-508-083-00 CONNECTOR, XLR, 3P, FEMALE
TIME CODE OUT	1-508-083-00 CONNECTOR, XLR, 3P, FEMALE
MONITOR	1-506-161-00 CONNECTOR, 8P, MALE
TBC REMOTE	1-561-610-21 CONNECTOR, 15P, FEMALE and 1-561-929-00 JUNCTION SHELL
REMOTE-1 IN (9P) REMOTE-1 OUT (9P)	1-560-651-00 CONNECTOR, 9P (M) and 1-561-749-00 JUNCTION SHELL, 9P
REMOTE-2 (36P)	1-508-852-00 CONNECTOR 36P, MALE

## 1-5. INPUT/OUTPUT SIGNALS OF THE CONNECTOR

### Component output parameters

#### Output

##### DUB/COMPONENT 1

Output impedance  
: 75 ohms

Output video amplitude  
: 100/0/100/0 color bars

Luminance with sync  
: 1.0 V p-p

Color difference  
: 0.7 V p-p

##### COMPONENT 2

Output impedance  
: 75 ohms

Output video amplitude  
: 100/0/100/0 color bars

Luminance with sync  
: 1.0 V p-p  $\pm 2\%$

Color difference  
: 0.7 V p-p  $\pm 2\%$

### Composite input/output parameters

#### Input

Input impedance  
: 75 ohms

Reference video amplitude  
: 1V p-p

#### Output

Output impedance  
: 75 ohms

Composite video amplitude  
: 1V p-p

### Audio output parameters

#### Output

##### Audio line output level

:  $-\infty$  to +14 dBu (nominal: +4 dBu), 600 ohms, balanced

##### Monitoring output level

:  $-\infty$  to +14 dBu (nominal: +4 dBu), 600 ohms, balanced

##### Headphones output level

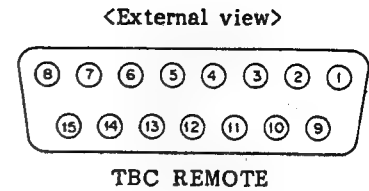
:  $-\infty$  to -12 dBu, 8 ohms, unbalanced

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The output level of a component signal conforms to the EBUN-10 standard.

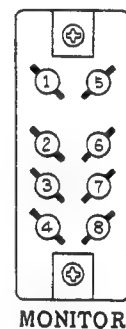
## TBC REMOTE

Pin No.	Description	Operating Voltage	IN/OUT
1	SYNC CONTROL	-5 V to +5 V	IN
2	HUE CONTROL	-5 V to +5 V	IN
3	SC CONTROL	-5 V to +5 V	IN
4	VIDEO LEVEL CONTROL	-5 V to +5 V	IN
5	SETUP CONTROL	-5 V to +5 V	IN
6	CHROMA LEVEL CONTROL	-5 V to +5 V	IN
7	-12 V	-12 V	OUT
8	GND	—	IN/OUT
9	FRAME GND	—	IN/OUT
10	NC	—	—
11	NC	—	—
12	NC	—	—
13	Y/C DELAY CONTROL	-5 V to +5 V	IN
14	NC	—	—
15	+12 V	+12 V	OUT



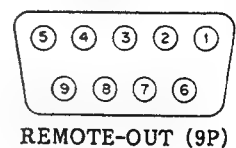
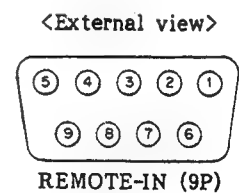
## MONITOR

Pin No.	Output Signal
1	AUDIO MONITOR OUT (X)
2	VIDEO OUT (X)
3	—
4	—
5	AUDIO MONITOR OUT (G)
6	VIDEO OUT (G)
7	—
8	—



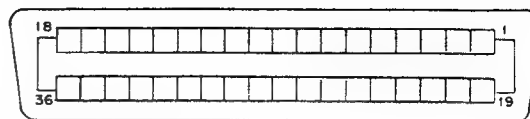
## REMOTE-1 IN (9P)/REMOTE-1 OUT (9P)

Pin No.	Controlling Device	Controlled Device
1	Frame Ground	Frame Ground
2	Receive A	Transmit A
3	Transmit B	Receive B
4	Transmit Common	Receive Common
5	Spare	Spare
6	Receive Common	Transmit Common
7	Receive B	Transmit B
8	Transmit A	Receive A
9	Frame Ground	Frame Ground





# REMOTE-2 (36P)



REMOTE-2 (36P)

Pin No.	Description	Level
1	UNREG 5 V	TTL
2	L-FF COMMAND IN	TTL
3	L-FWD COMMAND IN	TTL
4	L-REW COMMAND IN	TTL
5	L-EJECT COMMAND IN	TTL
6	L-STOP COMMAND IN (*1)	TTL
7	L-PAUSE COMMAND IN (*1)	TTL
8	L-REC COMMAND IN	TTL
9	L-CUT IN COMMAND IN	TTL
10	L-EDT COMMAND IN	TTL
11	L-CUT OUT COMMAND IN	TTL
12	L-FF STATUS OUT	TTL
13	L-FWD STATUS OUT	TTL
14	L-REW STATUS OUT	TTL
15	L-STANDBY STATUS OUT	TTL
16	L-STOP STATUS OUT	TTL
17	L-PAUSE STATUS 1 IN/OUT	TTL
18	L-REC STATUS OUT	TTL
19	L-INSERT STATUS OUT	TTL
20	L-VIDEO INSERT IN	TTL
21	L-AUDIO-1 INSERT IN	TTL
22	L-AUDIO-2 INSERT IN	TTL
23	L-REVERSE COMMAND IN	TTL
24	SPEED A IN	TTL
25	SPEED B IN	TTL
26	L-CTL PULSE OUT (*2)	TTL
27	L-TACH OUT	TTL
28	L-CAPSTAN LOCK OUT	TTL
29	SYNCHRONIZE IN	3.0 V; 0 % -0.3 V; -10 to -15 % +6 V; +10 to +15 %



30	L-STILL TENSION IN (*3)	—
31	H-NORMAL FWD IN	TTL
32	L-PAUSE STATUS 2 OUT	TTL
33	L-SEARCH STATUS IN	TTL
34	NC (*2)	—
35	GND	—
36	GND	—

**NOTES:**

- \*1. Holding pins 6 and 7 low simultaneously places unit in the "STANDBY ON/OFF" mode.
- \*2. When connecting the BVBC-10, set S302 on the SY-61A board to ON.
- \*3. When connecting the BVR-510A, set System Setup Item 204 to "ENABLE" (refer to Section 1-7).

## 1-6. SELECT SWITCH AND SHORT PLUG SETTING

### 1-6-1. Select Switch Setting

Along with the select switches on the control panel and function control panel, there are system select switches on the circuit boards. These switches must be set according to operating condition.

#### TBC-7P/7D/7E Board

##### S100: Y DIGITAL CLAMP Switch

When the set is shipped, this switch is set to the OFF position.

##### S101: VISC ON/OFF Switch

When the set is shipped, this switch is set to the ON position.

##### S200: TEST Switch

When the set is shipped, this switch is set to the ON position.

##### S400: C DIGITAL CLAMP Switch

When the set is shipped, this switch is set to the OFF position.

(Used for electrical alignment at the factory.)

#### TBC-8P/12P Board

##### S500: Bit 1 DIGITAL COMB FILTER CHROMA NOISE CANCEL Switch (G-1)

ON: Turns the chroma digital comb filter off.

OFF: Turns the chroma digital comb filter on.

When the set is shipped, this switch is set to the OFF position.

##### Bit 2 LINE ADDER ON/OFF Switch

ON: Turns the line adder on during DT.

OFF: Turns the line adder off during DT.

When the set is shipped, this switch is set to the OFF position.

##### Bit 3 Undefined.

When the set is shipped, this switch is set to the OFF position.

##### Bit 4 VISC MUTE ON/OFF switch

ON: Outputs a VISC signal to the VIDEO OUT connector.

OFF: Outputs no VISC signal to the VIDEO OUT connector.

When the set is shipped, this switch is set to the OFF position.

#### TBC-9P Board

S3: Bits 1 through 8 / S4: Bits 1 and 7

##### BLANKING POSITION Select Switch (D-1)

During blanking, the arbitrary location of lines 9 through 23 can be selected using S3 and S4.

DIP switch	Line	DIP switch	Line
S3 - Bit 1	9	S4 - Bit 1	17
S3 - Bit 2	10	S4 - Bit 2	18
S3 - Bit 3	11	S4 - Bit 3	19
S3 - Bit 4	12	S4 - Bit 4	20
S3 - Bit 5	13	S4 - Bit 5	21
S3 - Bit 6	14	S4 - Bit 6	22
S3 - Bit 7	15	S4 - Bit 7	23
S3 - Bit 8	16		

Turn on the bit of the switch corresponding to the blanking line.

When the set is shipped, this switch is set to the all ON position.

**S4: Bit 8 TBC SYNC DELAY ON/OFF Switch (C-1)**

For playback and EE pictures, the video signal is shifted by 16H relative to a sync signal (shifted 16H in the EE mode). The picture is thus shifted on the monitor.

To prevent the picture from being shifted, the sync signal of a playback picture is delayed by 16H relative to a reference input signal.

ON: Delayed by 16H.

OFF: Not delayed (in phase with reference sync signal).

When the set is shipped, this switch is set to the ON position.

**S2: Y-MUTE ON/OFF Switch (A-4)**

(Used for electrical alignment at the factory.)

ON: Mutes the Y signal of the composite signal output from the VIDEO OUT connector.

OFF: Outputs a normal composite signal from the VIDEO OUT connector.

When the set is shipped, this switch is set to the OFF position.

**S3: VIDEO OUTPUT SIGNAL Select Switch (A-3)**

This switch selects the type of video signal output from the VIDEO OUTPUT 2 connector on the connector panel.

ON: Outputs a non-composite video signal.

OFF: Outputs a composite video signal.

When the set is shipped, this switch is set to the OFF position.

**EN-48P Board**

**S1: COLOR/B&W Mode Select Switch (A-3)**

(Used for electrical alignment at the factory.)

ON: B&W mode

OFF: COLOR mode

When the set is shipped, this switch is set to the OFF position.

**S4: REGENE 1 Switch**

This switch selects whether a VISC signal is output from the DUB/COMPONENT 1 OUT connector.

ON: Output with a VISC signal.

OFF: Output without a VISC signal.

When the set is shipped, this switch is set to the ON position.

**S2: ID BLANKING ON/OFF Switch (A-2)**

(Used for electrical alignment at the factory.)

Selects whether a color framing ID pulse should be added to the component signal.

ON: Adds a color framing ID pulse.

OFF: Does not add a color framing ID pulse.

When the set is shipped, this switch is set to the OFF position.

**S5: REGENE 2 Switch**

This switch selects whether a VISC signal is output from the COMPONENT 2 OUT connector.

ON: Output with a VISC signal.

OFF: Output without a VISC signal.

When the set is shipped, this switch is set to the OFF position.

**VO-18AP Board**

**S1: Character Background Color Select Switch**

W BACK: The background is white with black characters.

B BACK: The background is black with white characters.

When the set is shipped, this switch is set to the B BACK position.

**SY-61A Board**

**S101: CHARACTER ON/OFF Switch (E-12)**

ON: A character signal (time code and so on) is superimposed on the video signal which is output from the VIDEO OUT 3 connector and MONITOR connector.

OFF: No character signal is superimposed on the output video signal.

When the set is shipped, this switch is set to the ON position.

**S102: REEL POSITION Switch (C-12)**

When a cassette tape is inserted, the cassette size is detected and the reel table is automatically moved to the position corresponding to the cassette tape.

This switch is used to move the reel table position without inserting a cassette tape (when the switch is pressed repeatedly, the mode alternates between L and S).

**S103: SYSTEM SETUP MENU Switch (B-12)**

This switch is used to interface with an external unit and/or set the BVW-65P's initial setup status. When the switch is pressed, a menu is displayed.

**S105: SYSTEM SETUP SET Switch (B-12)**

Press this switch after the displayed setup data on the menu is set. New data is then set.

**S106: SYSTEM SETUP MENU Select Switch (A-11)**

ON: Enables setup menu-1/2 operation.

OFF: Enables setup menu-1 operation.

When the set is shipped, this switch is set to the OFF position.

**S202: VTR CONTROL Switch (F-12)**

EXT: Set when the BVW-65P is controlled remotely.

INT: Set when the BVW-65P's operation panel is used.

When the set is shipped, this switch is set to the INT position.

S203 and S204: Undefined.

**S206: SYSTEM RESET Switch (G-12)**

When this switch is pressed, the VTR is reset to the same state as when power is turned on.

**S302: TAPE DIRECTION SIGNAL ON/OFF Switch (H-6)**

This switch selects whether a TAPE

DIRECTION (L-REV) signal should be output to pin 34 of a REMOTE-2 (36-pin) connector.

ON: Outputs a signal.

OFF: Outputs no signal.

This switch selects whether a TAPE DIRECTION (L-REV) signal should be output to pin 34 of a REMOTE-2 (36-pin) connector.

**SY-64AP Board**

**S1: VITC/AUTO/LTC Select Switch (H-1)**

This switch selects whether the time code or user bit on the counter display indicator should be displayed using an LTC or VITC.

VITC: Displayed using a VITC.

AUTO: Displayed using an LTC when the tape runs at more than 1/2 times normal speed and displayed using a VITC when it runs at less than 1/2 times normal speed.

Displayed using an LTC in the REC/EE mode.

LTC: Displayed using an LTC.

When the set is shipped, this switch is set to the LTC position.

**S301 and S302: Impact Error Compensator Adjusting Switches (at the factory) (H-8, G-8)**

These switches are used to adjust the impact error compensator circuit.

ON: Normal setting

When the set is shipped, these switches are set to the ON position.

**SV-82A Board**

**S101: Bit 1 TENSION SERVO ON/OFF Switch (B-1)**  
(Used for electrical alignment at the factory.)

ON: The tension servo feedback is not locked. Servo trouble detection is stopped.

OFF: The tension servo feedback is locked. Servo trouble detection is done.

When the set is shipped, this switch is set to the OFF position.

**Bit 2 Forcible INSTANT START ON/OFF Switch**

(Used for electrical alignment at the factory.)

ON: The forcible instant start circuit is always activated in the PLAY mode.

OFF: The forcible instant start circuit is activated for 0.5 seconds in the PLAY mode, and the VTR then enters the NORMAL PLAY mode.

When the set is shipped, this switch is set to the OFF position.

**Bit 3 Forcible REC Mode Switch**  
(Used for mechanical alignment.)

This switch is used to play back a tape with the audio signal recorded on the CTL track (CTL height adjustment).

ON: The VTR enters the forcible REC mode to make the tape run at a fixed speed.

OFF: Normal setting

When the set is shipped, this switch is set to the OFF position.

**Bit 4 PHI-SQUARE SERVO ON/OFF Switch**

ON: The phi-square servo is not activated.

OFF: The phi-square servo is activated.

When the set is shipped, this switch is set to the ON position.

**SV-83B Board**

**S1: H SHIFT MUTE Switch (A-3)**

This switch is used to cancel the H lock during adjustment.

ON: The H lock is canceled.

OFF: The H lock is activated.

When the set is shipped, this switch is set to the OFF position.

**DT-13 Board**

**S201: Bit 1 WOBBLING ON/OFF Switch (F-1)**  
(Used for electrical alignment.)

ON: Inhibits DT head wobbling.

OFF: Enables normal DT head wobbling.

When the set is shipped, this switch is set to the OFF position.

**Bit 2 DYNAMIC TRACKING ON/OFF Switch**  
(Used for electrical alignment.)

ON: Inhibits dynamic tracking.

OFF: Enables normal dynamic tracking.

When the set is shipped, this switch is set to the OFF position.

Bits 3 and 4: Undefined.

**S202: DEMAGNETIZE START Switch (E-1)**

Pressing this switch starts demagnetizing.

**DT-14P Board**

**S1: TRACKING SERVO ON/OFF Switch at Y/C delay (A-1)**

ON: Inhibits tracking servo.

OFF: Enables normal tracking servo.

When the set is shipped, this switch is set to the OFF position.

**AU-118P Board**

**S102, S202 (D-3, E-8)**

Used for electrical adjustment.

**DP-73 Board**

**S1: SCALE VU/dB Select Switch**

VU: Displays the audio level in VU.

dB: Displays the peak-to-peak audio level.

When the set is shipped, this switch is set to the VU position.

**S2: TEST Switch**

(Used for electrical alignment.)

ON: All indicators of the audio level meter light.

OFF: Normal display

When the set is shipped, this switch is set to the OFF position.

### **Setting the PB PRESET level**

To set the PB preset level relative to the factory setting (+4dBm), use variable resistors on the BF-28A board according to the electrical alignment. The preset level can be set from -6dB to +6dB relative to the factory setting level.

(CH-1/RV102, CH-2/RV202, CH-3/RV302,  
CH-4/RV402)

### **1-6-2. Short Plug Setting**

There are short plugs on the printed circuit boards. These plugs must be set according to operating condition.

#### **DM-56P Board**

SP101 and SP102: Y RF AGC ON/OFF

(Used for electrical alignment.)

When the set is shipped, SP101 is set to the OPEN position, and SP102 to the SHORT position.

SP301: Y Signal ON/OFF

(Used for electrical alignment.)

When the set is shipped, SP301 is set to the SHORT position.

SP501 and SP502: C RF AGC ON/OFF

(Used for electrical alignment.)

When the set is shipped, SP501 is set to the OPEN position, and SP502 to the SHORT position.

SP701: C Signal ON/OFF

(Used for electrical alignment.)

When the set is shipped, SP701 is set to the SHORT position.

#### **AU-118P Board**

SP101 and SP201: Audio Phase Adjustment

(Used for electrical alignment.)

When the set is shipped, SP101 and SP201 are set to the SHORT position.

## 1-7. SYSTEM CONTROL SETUP

Various select switches are provided on the control panel, subcontrol panel, and printed circuit board in the unit (refer to Section 1-6 "Select Switch and Short Plug Setting").

For the system control items described below, the initial setting at the factory can be set as in Section 1-6 Select Switch and Short Plug Setting.

### ITEM LIST FOR INITIAL SETUP MENU

#### Setup Menu - 1

##### ITEM-000 SERIES: OPERATIONAL KEY PARAMETER

- 001: PREROLL TIME
- 002: CHARACTER H-POSITION
- 003: CHARACTER V-POSITION
- 004: CHARACTER V-SIZE
- 005: DISPLAY INFORMATION SELECT
- 006: LOCAL FUNCTION ENABLE
- 007: TAPE TIMER DISPLAY

#### Setup Menu - 2

##### ITEM-100 SERIES: OPERATIONAL PARAMETER

- 101: SELECTION FOR SEARCH DIAL ENABLE
- 102: MAXIMUM TAPE SPEED
- 103: AUDIO SELECTED LINE OUT
- 104: AUDIO MUTING TIME
- 105: REF VIDEO MISSING ALARM
- 106: CAPSTAN LOCK
- 111: PROGRAM PLAY

##### ITEM-200 SERIES: REMOTE INTERFACE PARAMETER

- 201: PARA RUN
- 202: CF FLAG REPLY (625/50 ONLY)
- 203: STANDBY COMMAND FOR REMOTE-2 I/F
- 204: STILL TENSION CMD IN REMOTE-2 I/F

##### ITEM-300 SERIES: EDITING PARAMETER

- 301: VAR SPEED RANGE FOR SYNCHRONIZATION
- 302: CAPSTAN RELOCKING DIRECTION
- 305: SYNC GRADE
- 306: DMC INITIAL SPEED
- 307: AUTO-DELETION FOR INCONSISTENT DATA



ITEM-400 SERIES: PREROLL PARAMETER

- 401: FUNCTION MODE AFTER CUE-UP
- 402: TIME REFERENCE FOR PREROLL
- 403: AUTOMATIC PREROLL REFERENCE  
ENTRY

ITEM-500 SERIES: TAPE PROTECTION PARAMETER

- 501: STILL TIMER
- 502: TAPE PROTECTION MODE FROM SEARCH
- 503: TAPE PROTECTION MODE FROM STOP
- 504: DRUM ROTATION IN STANDBY OFF

ITEM-800 SERIES: MISCELLANEOUS PARAMETER

- 801: BVE-3000 OPERATION

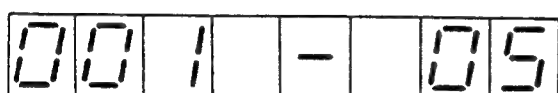
ITEM-900 SERIES: ADJUSTMENT USE ONLY

- 901: AUDIO NR IN SP MODE
- 902: EMERGENCY TAPE PROTECTION
- 907: CONFI SELECT IN PB MODE

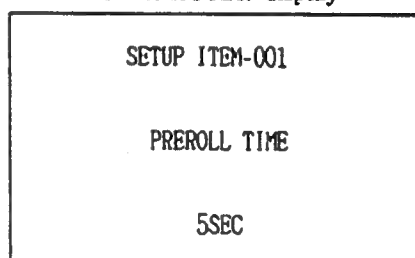
### 1-7-1. Setup

- . The system control is set up according to the following procedure.
  - . The setup appears on the function control panel's time counter display and monitor television.  
(To display the setup on the monitor, connect the monitor television to the VIDEO OUT-3 connector on the connector panel and turn on the CHARACTER ON/OFF switch on the SY-61A board.)
- (1) Turn on the unit POWER switch.
  - (2) Press the SYSTEM SETUP MENU switch on the SY-61A board; the SETUP ITEM-001 and PREROLL TIME are displayed.

Time counter display on the function control panel



CHARACTER display



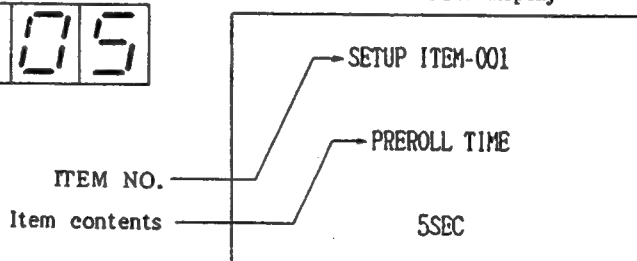
- (3) After the JOG mode is entered, turn the search dial and select the setup item to be set (the time counter display ITEM NO. blinks). Turn the search dial clockwise to increase the item number and counterclockwise to decrease it.

Time counter display on the function control panel



ITEM NO. blinks.

CHARACTER display



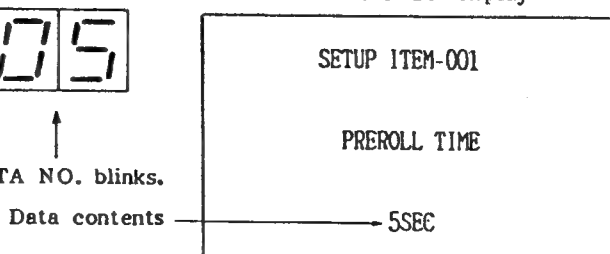
- (4) Turn the search dial while pressing the search button and set the data (the time counter display DATA NO. blinks). Turn the search dial clockwise to increase the data number and counterclockwise to decrease it.

Time counter display on the function control panel



DATA NO. blinks.

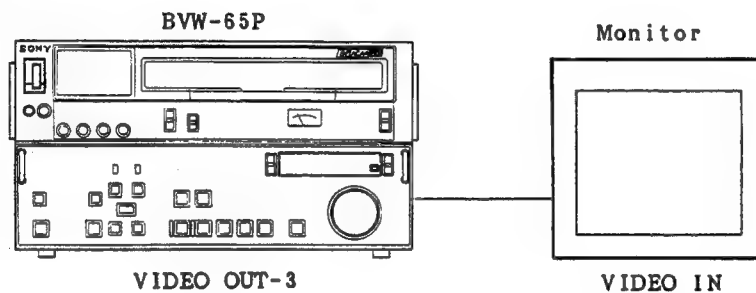
CHARACTER display



- (5) To set other setup items, repeat Steps 3 and 4.
- (6) Press the SYSTEM SETUP switch on the SY-61A board after the data has been set. Setup data is then written into a nonvolatile memory (NVRAM). After that, the setting data remains unchanged even if the POWER switch is turned off.
- (7) To turn all data to the factory settings, press the time counter display RESET button after pressing the SYSTEM SETUP MENU switch.

Notes: For factory settings only the SETUP MENU-1 can be set as described above. To set the SETUP MENU-2, turn on switch S106 on the SY-61A board and set it in the same manner as described above.

#### Connection



# 1-7-2. Setup Item/Data

Setup Item		Setup Data		Item and Data Description
ITEM NO. Time Counter	Item Character Display	DATA NO. Time Counter	DATA Character Display	
ITEM-000 SERIES; OPERATIONAL KEY PARAMETER				
001	PREROLL TIME	00	0 SEC	Preroll time setting. The preroll time can be set from 0 to 15 seconds. When the unit is used for editing, the preroll time setting should be three seconds or more.  Factory setting: DATA No.05 (5 SEC)
		01	1 SEC	
		02	2 SEC	
		03	3 SEC	
		04	4 SEC	
		05	5 SEC	
		06	6 SEC	
		07	7 SEC	
		08	8 SEC	
		09	9 SEC	
		10	10 SEC	
		11	11 SEC	
		12	12 SEC	
		13	13 SEC	
		14	14 SEC	
		15	15 SEC	
002	CHARACTER H-POSITION	00	00/16	The time data and status monitor output from the VIDEO OUT-3 connector are positioned in the horizontal direction. When the DATA NO. is set to 00, the character is displayed at the left end of the screen. As the DATA NO. is increased, the character is moved by 1/16 steps of the display to the right.  Factory setting: DATA NO.04 (04/16)
		01	01/16	
		02	02/16	
		03	03/16	
		04	04/16	
		05	05/16	
		06	06/16	
		07	07/16	
		08	08/16	
		09	09/16	
		10	10/16	
		11	11/16	
		12	12/16	
		13	13/16	
		14	14/16	
		15	15/16	
003	CHARACTER V-POSITION	00	00/16	The time data and status monitor output from the VIDEO OUT-3 connector are positioned in the vertical direction. When the DATA NO. is set to 00, the character is displayed at the top of the screen. When it is set to 15, the character is displayed at the bottom of the screen.  Factory setting: DATA NO.12 (12/16)
		01	01/16	
		02	02/16	
		03	03/16	
		04	04/16	
		05	05/16	
		06	06/16	
		07	07/16	
		08	08/16	
		09	09/16	
		10	10/16	
		11	11/16	
		12	12/16	
		13	13/16	
		14	14/16	
		15	15/16	

004	CHARACTER V-SIZE	0 1	SMALL LARGE	<p>The vertical size of the time data and status monitor output from the VIDEO OUT-3 connector is set.</p> <p>DATA NO.0: SMALL DATA NO.1: LARGE</p> <p>Factory setting: DATA NO.0 (SMALL)</p>
005	DISPLAY INFORMATION SELECT	0 1 2  3	TIME DATA & STATUS TIME DATA TIME & STATUS & MODE  REPLAY INDICATE	<p>When the CHARACTER ON/OFF switch is turned on, the data output from the VIDEO OUT-3 connector is selected.</p> <p>DATA NO.0: Displays the time data and status monitor. DATA NO.1: Displays the time data. DATA NO.2: Displays the time data, status monitor, and VTR mode. DATA NO.3: The letter 'R' is displayed during DT play mode.</p> <p>Note: The VTR mode indicates whether the VTR is in the SP mode (Metal tape) or STD mode (Oxide tape). Usually, the SP mode is entered during cassette-out operation. When DATA NO.2 is selected, the previous cassette's mode is held.</p> <p>Factory setting: DATA NO.0 (TIME DATA &amp; STATUS)</p>
006	LOCAL FUNCTION ENABLE	0 1 2	ALL DISABLE STOP & EJECT ALL ENABLE	<p>When the VTR is set to the REMOTE mode, the switches/buttons on the function control panel are selected.</p> <p>DATA NO.0: No switches/buttons are activated. DATA NO.1: Only STOP and EJECT buttons are activated. DATA NO.2: All switches/buttons are activated.</p> <p>Factory setting: DATA NO.1 (STOP &amp; EJECT)</p>
007	TAPE TIMER DISPLAY	0 1	+/-12H 24H	<p>Selects whether the CTL counter is displayed by <math>\pm 12H</math> or 24H.</p> <p>DATA NO.0: Displayed by <math>\pm 12H</math>. DATA NO.1: Displayed by 24H</p> <p>Factory setting: DATA NO.0 (<math>\pm 12H</math>)</p>

ITEM-100 SERIES; OPERATIONAL PARAMETER				
101	SELECTION FOR SEARCH DIAL ENABLE	0 1	DIAL DIRECT VIA SEARCH BUTTON	<p>Sets entering the SEARCH mode.</p> <p>DATA NO.0: When the SEARCH dial is turned, the VTR enters the SEARCH mode from any mode other than REC/EDIT.</p> <p>DATA NO.1: When the SEARCH button is pressed, the VTR enters the SEARCH mode.</p> <p>Factory setting: DATA NO.0 (DIAL DIRECT)</p>
102	MAXIMUM TAPE SPEED	0 1 2	X 42 X 42 (SHUTTLE X 24) X 24	<p>Sets the maximum tape speed in the SEARCH mode.</p> <p>DATA NO.0: The maximum tape speed which is in the F.FWD/REW mode and which can be set using a dial in the SHUTTLE mode is 42 times normal speed.</p> <p>DATA NO.1: The maximum tape speed in the F.FWD/REW mode is 42 times normal speed. The maximum tape speed which can be set using a dial in the SHUTTLE mode is 24 times normal speed.</p> <p>DATA NO.2: The maximum tape speed which is in the F.FWD/REW mode and which can be set using a dial in the SHUTTLE mode is 24 times normal speed.</p> <p>Factory setting: DATA No.1 (X 42 (SHUTTLE X 24))</p>

103	AUDIO SELECTED LINE OUT	0	MANUAL	<p>Selects the signal output to AUDIO SELECTED OUTPUT.</p> <p>DATA NO.0: The selected signal is output using the AUDIO MONITOR SELECT switch.</p> <p>DATA NO.1: An AFM (CH-3/CH-4) signal is output in stereo in the metal particle tape PB mode, and an LNG (CH-1/CH-2) signal in the oxide tape PB mode.</p> <p>DATA NO.2: The selected signal is output using the AUDIO MONITOR SELECT switch. However, when the AFM signal is selected in the variable-speed play mode, the LNG signal is output automatically.</p> <p>NOTE: When this item is set to AUTO, the level of the signal output from the SELECTED output connectors cannot be adjusted by any volumes.</p> <p>Factory setting: DATA NO.0 (MANUAL)</p>
		1	AUTO AFM/LNG	
			SELECT	
		2	AUTO LNG SELECT	
104	AUDIO MUTING TIME	00	OFF	<p>When the VTR enters the PLAY mode from the STOP or STILL mode, sets the muting time of an audio signal. The muting time of the audio signal can be set from 0 (OFF) (not muted) to 1.0 second.</p> <p>Factory setting: DATA NO.00 (OFF)</p>
		01	0.1 SEC	
		02	0.2 SEC	
		03	0.3 SEC	
		04	0.4 SEC	
		05	0.5 SEC	
		06	0.6 SEC	
		07	0.7 SEC	
		08	0.8 SEC	
		09	0.9 SEC	
		10	1.0 SEC	

105	REF VIDEO MISSING ALARM	0 1	OFF ON	<p>When no REF video signal is supplied, selects whether it should be displayed as an alarm.</p> <p>DATA NO.0: No alarm display DATA NO.1: The STOP button lamp flashes as alarm display.</p> <p>Factory setting: DATA NO.0 (OFF)</p>
106	CAPSTAN LOCK	0 1 2 3	SWITCH SELECT 2F 2F/4F 4F	<p>Selects the CAPSTAN LOCK mode.</p> <p>DATA NO.0: Selected using capstan lock switch on the sub control panel.</p> <p>DATA NO.1: Capstan lock mode is 2F in spite of switch position.</p> <p>DATA NO.2: Capstan lock mode is 2F /4F in spite of switch position.</p> <p>DATA NO.3: Capstan lock mode is 4F in spite of switch position.</p> <p>Factory setting: DATA NO.0 (SWITCH SELECT)</p>
111	PROGRAM PLAY	0 1	DISABLE ENABLE	<p>Selects the DISABLE/ENABLE program play mode.</p> <p>DATA NO.0: Program play mode in operational.</p> <p>DATA NO.1: Program play mode in operational.</p> <p>Factory setting: DATA NO.0 (DISABLE)</p>



ITEM-200 SERIES; REMOTE INTERFACE PARAMETER				
201	PARA RUN	0 1	DISABLE ENABLE	<p>Selects whether two (or more) VTRs should be operated in parallel operation.</p> <p>DATA NO.0: No parallel operation DATA NO.1: Operation can then be parallel.</p> <p>Note: To operate VTRs in parallel operation, set Item 201 of all VTRs to DATA NO.1.</p> <p>Factory setting: DATA NO.0 (DISABLE)</p>
202	CF FLAG REPLAY (625/50 ONLY)	0 1	8F 4F or 8F	<p>Selects to which mode the COLOR FRAME LOCK STATUS fed to the remote controller is set.</p> <p>DATA NO.0: 8F(Indicates that data is locked at 8 fields.) DATA NO.1: 4F or 8F (Indicates that data is locked at 4 fields or 8 fields.)</p> <p>Factory setting: DATA NO.0 (8F)</p>
203	STANDBY COMMAND FOR REMOTE-2 I/F	0 1	STOP & PAUSE STOP OR PAUSE	<p>Selects the STANDBY ON/OFF mode using the remote control unit which is connected to the REMOTE-2 connector (36-pin).</p> <p>DATA NO.0: When the STOP and PAUSE buttons are pressed simultaneously, the STANDBY mode is turned on or off. DATA NO.1: When the STOP button is pressed, the STANDBY ON mode is entered. When the PAUSE button is pressed in the STOP mode, the STANDBY mode is turned on or off.</p> <p>Factory setting: DATA NO.0 (STOP &amp; PAUSE)</p>
204	STILL TENSION CMD IN REMOTE-2 I/F	0 1	DISABLE ENABLE	<p>When a STILL TENSION command is output from the remote control unit connected to the 36-pin REMOTE-2 connector, selects whether the VTR accepts the command.</p> <p>DATA NO.0: No command is accepted. DATA NO.1: A command is accepted.</p> <p>Note: Select DATA NO.0 when connected to BVE-3000 and DATA NO.1 when connected to BVR-510A.</p> <p>Factory setting: DATA NO.0 (DISABLE)</p>

ITEM-300 SERIES; EDITING PARAMETER

301	VAR SPEED RANGE FOR SYNCHRONIZA- TION	0 1	-1      +2 -1.15    +2.3	<p>Sets the speed range when the variable speed is controlled using the remote control unit connected to the REMOTE-1 connector (9-pin).</p> <p>DATA NO.0: -1 to +2 DATA NO.1: -1.15 to +2.3</p> <p>Note: Select DATA NO.1 when connected to the BVE-900 editing controller for DT editing. When DATA NO.1 is selected or the DT playback is done at -1 to +2 times normal speed or more, the picture may be missed at the bottom of the screen (this is not a defect).</p> <p>Factory setting: DATA NO.0 (-1 ~ +2)</p>
302	CAPSTAN RELOCKING DIRECTION	0 1	DECELERATION ACCELERATION	<p>When the CAPSTAN LOCK switch on the subcontrol panel is set to 4F, selects whether the capstan servo is locked in the acceleration or deceleration mode.</p> <p>DATA NO.0: Locked in the deceleration mode. DATA NO.1: Locked in the acceleration mode.</p> <p>Factory setting: DATA NO.0 (DECELERATION)</p>
305	SYNC GRADE	0 1	ACCURATE ROUGH	<p>Selects the editing accuracy when switch S201 (SYNCHRONIZE SW) on the SY-61A board is set to ON and editing is done in the sync mode.</p> <p>DATA NO.0: Editing is done with editing accuracy <math>\pm 0</math> frame. DATA NO.1: Editing is done with editing accuracy <math>\pm 1</math> frame.</p> <p>Factory setting: DATA NO.0 (ACCURATE)</p>

306	DMC INITIAL SPEED	00 01 02 03 04 05 06 07 08 09 10 11 12 13	MANUAL PLAY STILL +0.03 +0.1 +0.2 +0.5 +1 +2 -0.03 -0.1 -0.2 -0.5 -1	<p>Selects the initial speed which is set automatically in selecting DMC (Dynamic Motion Control).</p> <p>DATA NO.00: Sets the initial speed by the rotation angle of the search dial.</p> <p>DATA NO.01: The initial speed is a speed in the PLAY mode.</p> <p>DATA NO.02: The tape stops (STILL MODE).</p> <p>DATA NO.03 to 13: The initial speed is a speed in the search mode.</p> <p>Factory setting: DATA NO.00 (MANUAL)</p>
307	AUTO-DELETION FOR INCONSISTENT DATA	0 1 2	MANUAL NEG AND EXCESS NEG	<p>Selects the operation when an erroneous edit point is set.</p> <p>DATA NO.0: The DELETE lamp blinks and the ALARM display appears. Delete the undesired edit point or set the edit point correctly.</p> <p>DATA NO.1: When the edit point is set as IN <math>\geq</math> OUT or AUDIO IN <math>\geq</math> AUDIO OUT or the number of edit points is excessive, the previously entered edit point is deleted automatically.</p> <p>DATA NO.2: When the edit point is set as IN <math>\geq</math> OUT or AUDIO IN <math>\geq</math> AUDIO OUT, the previously entered edit point is deleted automatically. When the number of edit points is excessive, the DELETE lamp blinks and the ALARM display appears.</p> <p>Notes: . When the edit point's key and the DELETE key are pressed simultaneously, data at the edit point is deleted.  . When an erroneous edit point is set (the DELETE lamp blinks), editing (PREVIEW or AUTO EDIT) is not executed.</p> <p>Factory setting: DATA NO.0 (MANUAL)</p>

ITEM-400 SERIES; PREROLL PARAMETER

401	FUNCTION MODE AFTER CUE-UP	0 1	STOP STILL	<p>Selects the mode after CUE-UP is completed.</p> <p>DATA NO.0: Enters the STOP mode. DATA NO.1: Enters the STILL mode.</p> <p>Factory setting: DATA NO.0 (STOP)</p>
402	TIME REFERENCE FOR PREROLL	0 1	CTL TC	<p>When a tape with the time code signal containing a discontinuous point is used and the discontinuous point is prerolled, selects whether the time code signal preceding the point is advanced and prerolled using a CTL signal.</p> <p>DATA NO.0: Advanced using a CTL signal. DATA NO.1: Not advanced using a CTL signal.</p> <p>Factory setting: DATA NO.0 (CTL)</p>
403	AUTOMATIC PREROLL REFERENCE ENTRY	0 1	DISABLE ENABLE	<p>Selects whether the IN point is entered by pressing only the PREROLL button when it is not entered during preroll operation.</p> <p>DATA NO.0: IN point is not entered automatically. DATA NO.1: IN point is entered automatically.</p> <p>Factory setting: DATA NO.0 (DISABLE)</p>

## ITEM-500 SERIES; TAPE PROTECTION PARAMETER

501	STILL TIMER	00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15	0.5 SEC 5 SEC 10 SEC 20 SEC 30 SEC 40 SEC 50 SEC 1 MIN 2 MIN 3 MIN 4 MIN 5 MIN 6 MIN 7 MIN 8 MIN 30 MIN	<p>The unit automatically enters the tape PROTECTION mode after it has been in the tape STOP (or STILL) mode for a fixed time to protect the video head and tape.</p> <p>This item sets the transition time of the tape STOP to tape PROTECTION mode.</p> <p>The time can be set from 0.5 seconds to 30 minutes.</p> <p>Factory setting: DATA NO.14 (8 MIN)</p>
502	TAPE PROTECTION MODE FROM SEARCH	0 1 2	STEP FWD STANDBY OFF TENSION RELEASE	<p>When the time in the STILL mode set using Item 501 passes, the unit enters the tape PROTECTION mode. This item selects the tape PROTECTION mode setting.</p> <p>DATA NO.0: When the time designated by Item 501 passes, the tape is sent repeatedly for 2 seconds at 1/30 times normal speed in the forward direction.</p> <p>DATA NO.1: When the designated time passes, the unit enters the STANDBY OFF mode.</p> <p>DATA No.2: When the designated time passes, the unit enters the TENSION RELEASE mode.</p> <p>Factory setting: DATA NO.0 (STEP FWD)</p>
503	TAPE PROTECTION MODE FROM STOP	0 1	STANDBY OFF TENSION RELEASE	<p>When the time in the STOP mode set using Item 501 passes, the unit enters the tape PROTECTION mode. This item selects the tape PROTECTION mode setting.</p> <p>DATA NO.0: When the designated time passes, the unit enters the STANDBY OFF mode.</p> <p>DATA NO.1: When the designated time passes, the unit enters the TENSION RELEASE mode.</p> <p>Factory setting: DATA NO.0 (STANDBY OFF)</p>
504	DRUM ROTATION IN STANDBY OFF	0 1	OFF ON	<p>Turns the drum motor ON or OFF in the STANDBY OFF mode.</p> <p>DATA NO.0: The drum rotation stops. DATA NO.1: The drum is rotated.</p> <p>Factory setting: DATA NO.0 (OFF)</p>

ITEM-800 SERIES; MISCELLANEOUS PARAMETER				
801	BVE-3000 OPERATION	0 1	OFF ON	Item 801 should be set to ON when interfacing with BVE-3000.  Factory setting: DATA No.0 (OFF)

ITEM-900 SERIES; ADJUSTMENT USE ONLY				
<p>The items below are not displayed on the normal menu to avoid the erroneous operation. To display these items, turn the SEARCH dial while pressing the PLAY button. The three items are used exclusively for adjustment. After adjustment is completed, the switches should be returned to the factory setting position.</p>				
901	AUDIO NR IN SP MODE	0 1	ON SWITCH SELECT	<p>This setting is used exclusively for audio adjustment. After adjustment is completed, be sure to return the switch to the factory setting position. The Dolby NR control is selected when a metal tape is used for recording and playback.</p> <p>DATA NO. 0: Turned on at all times when the metal tape is used.</p> <p>DATA NO. 1: Turned on or off using a Dolby NR switch on the subcontrol panel.</p> <p>Note: When an oxide tape is used, set using an Dolby NR switch on the subcontrol panel irrespective of this setting.</p> <p>Factory setting: DATA NO.0 (ON)</p>
902	EMERGENCY TAPE PROTECTION	0 1	ENABLE DISABLE	<p>This setting is used exclusively for servo and mechanism adjustments. After adjustment is completed, be sure to return the switch to the factory setting position. When the VTR detects an error in the tape transport system, selects whether tape protection is done or not.</p> <p>DATA NO. 0: Tape protection is done.</p> <p>DATA NO. 1: Tape protection is not done.</p> <p>Note: When the data No. is 1, "-" (minus) is displayed on the keyboard panel's time counter.</p> <p>Factory setting: DATA NO.0 (ENABLE)</p>



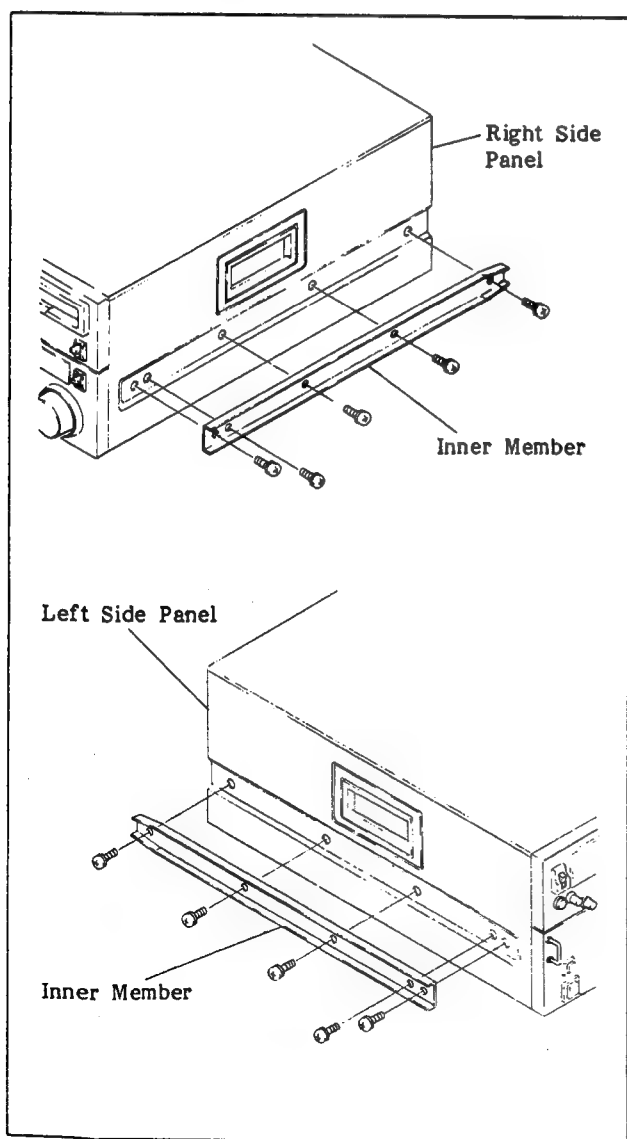
907	CONF1 SELECT IN PB MODE	0 1	DISABLE ENABLE	<p>This setting is used exclusively for confi head adjustment of the BVW-70P. After adjustment is completed, be sure to return the switch to the factory setting position. The playback video head is selected in the PB mode.</p> <p>DATA NO. 0: Enters the R/P HEAD PB mode in the PB mode.</p> <p>DATA NO. 1: Enters the CONF1 HEAD PB mode when the CONF1 switch on the keyboard panel is turned on. Enters the R/P HEAD PB mode when it is turned off.</p> <p>Factory setting: DATA NO.0 (DISABLE)</p>
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## 1-8. RACK MOUNTING

The unit can be mounted in the 19-inch standard rack. It is recommended to use the Rack Mount Kit, RMM-100, optional accessory (including the slide rails, the handle bracket and fixing screws) or the following ACCURIDE's slide rails.

- . RACK-MOUNT SLIDES MODEL 305
- . SLIDE LENGTH 22 INCH

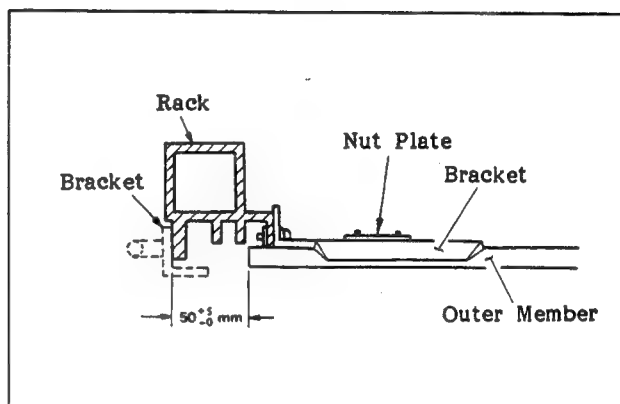
1. Remove the five fixing screws on the Right and Left Side Panels.
2. Install the Inner Members of the slide rails to the Right and Left Side Panels with the screws removed in Step (1).



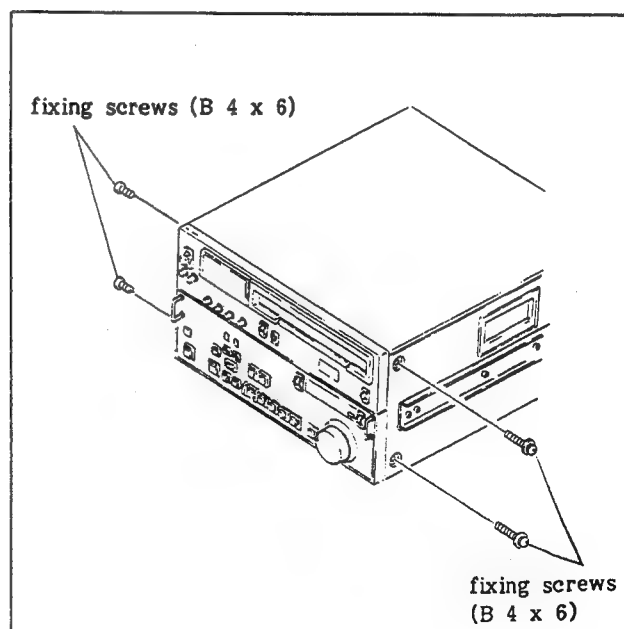
3. Remove the four feet on the Lower Panel.

If the unit is mounted in the rack with the feet attached, they will contact the lower and the upper portions of the rack and the unit cannot be pulled out from the rack.

4. Install the Outer Member bracket of the slide rail to the rack. Adjust the distance from the edge of the slide rail to the outside of the rack so that it meets the required specification.

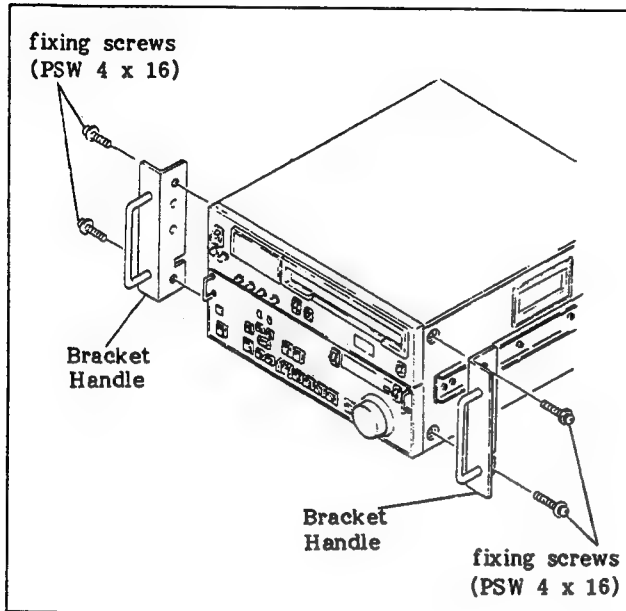


5. Remove the two fixing screws on the Right and Left Side Panels. (Be careful not to lose these four screws.)





6. Install the Handle Brackets with the supplied screws (PSW 4 x 16) for these brackets.



(NOTE) Never use screws (PSW 4 x 16) to install the Right and Left Side Panels. Be sure to install the Right and Left Side Panels with the screws (B 4 x 6) removed in Step (5). If using the screws (PSW 4 x 16) by mistake, may cause trouble in the unit.

- NOTE:**(1) When several units are mounted in a rack, it is recommended to install a fan for ventilation. Good air circulation is essential to prevent internal heat build-up in a rack (5 °C to 40 °C must be met for all units).
- (2) Never remove the Upper Panel and Lower Panels during rack mounting.
- (3) Be sure to secure the rack to the floor to avoid accidents when the unit is pulled out.

#### 1-9. SUPPLIED ACCESSORIES

Supplied accessories are as follows:

1. AC Power Code
2. 9-pin Remote Control Cable; RCC-5G
3. Extension Board; EX-116  
EX-134  
EX-151
4. Screws for Rack Mounting; PSW 4 x 16 (four)

#### 1-10. OPTIONAL ACCESSORIES

The followings are provided as the optional accessories. Suitable accessories should be used for each system.

1. Rack Mount Kit (RMM-100)  
The rack mount kit is used to mount the unit with the rack mount kit, RMM-100, in a standard 19-inch rack.
2. Cleaning Cassette Tape (BCT-5CLN)
3. Remote Control Unit (BVR-75A)



## SECTION 2

### TECHNICAL INFORMATION

#### 2-1. SPECIFICATIONS

##### GENERAL

Power requirements	: AC 90 to 265 V, 48 to 64 Hz
Power consumption	: 175 W
Operating temperature	: +5°C to +40°C
Storage temperature	: -20°C to +60°C
Humidity	: Less than 80 %
Weight	: 28 Kg
Dimensions	: 427 x 237 x 520 mm (w/h/d)
Tape speed	: 101.51 mm/s
Playback time	: 100 minutes maximum (with a BCT-90ML cassette)
Fast forward/rewind time	: Less than 180 seconds (with a BCT-90ML cassette)
Search speed	
Shuttle mode	: Still, 1/30, 1/10, 1/5, 1/2, 1, 2, 5, and 24 times normal in forward and reverse directions.
Variable mode	: Still, 1/30, 1/10, 1/5, 1/2, and 1 times normal in forward and reverse directions. 2 times normal in forward direction.
Jog mode	: Still to 1 in forward and reverse directions.
DT (Dynamic Tracking) range	: -1 to +2 times normal
Video cassette	: 1/2-inch, Betacam, and Betacam SP cassette for Beta format.
Metal particle tape	: BCT-5M/10M/20M/30M/ BCT-5ML/10ML/20ML/30ML/60ML/90ML or equivalent
Oxide tape	: BCT-5G/10G/20G/30G/ BCT-5GL/10GL/20GL/30GL/60GL/90GL or equivalent

**Component video characteristics (component input to component output, metal tape)**

**Bandwidth (relative to REF DC LEVEL)**

Luminance	: 25 Hz to 5.5 MHz	+0.5 -3.0 dB
Color difference	: 25 Hz to 2.0 MHz	+0.5 -3.0 dB

**Signal-to-noise ratio**

Luminance unweighted	: More than 48 dB (SC trap: OFF, 10 kHz to 5 MHz)
Color difference unweighted	: More than 48 dB (SC trap: OFF, 10 kHz to 5 MHz)

Y/C delay	: Less than 20 nsec
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**Low frequency non-linearity**

Luminance Y	: Less than 3%
Color difference	: Less than 4%

**Pulse distortion (luminance, 2T pulse)**

K-pulse	: Less than 1.5%
K-pb	: Less than 1.0%
K-bar	: Less than 1.0%

**Pulse distortion (color difference, 8T pulse)**

K-pulse	: Less than 1.5%
K-pb	: Less than 1.0%
K-bar	: Less than 1.0%

**Component video characteristics (component input to component output, oxide tape)**

**Bandwidth (relative to REF DC LEVEL)**

Luminance	: 25 Hz to 4.0 MHz	+0.5 -6.0 dB
Color difference	: 25 Hz to 1.5 MHz	+0.5 -3.0 dB

**Signal-to-noise ratio**

Luminance unweighted	: More than 46 dB (SC trap: OFF, 10 kHz to 5 MHz)
Color difference unweighted	: More than 45 dB (SC trap: OFF, 10 kHz to 5 MHz)

Y/C delay	: Less than 20 nsec
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**Low frequency non-linearity**

Luminance Y	: Less than 3%
Color difference	: Less than 4%

**Pulse distortion (luminance, 2T pulse)**

K-pulse	: Less than 3.0%
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**Pulse distortion (color difference, 8T pulse)**

K-pulse	: Less than 3.0%
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### Component output parameters

#### Output

##### DUB/COMPONENT 1

Output impedance	: 75 ohms
Output video amplitude	: 100/0/100/0 color bars
Luminance with sync	: 1.0 V p-p $\pm 2\%$
Color difference	: 0.7 V p-p $\pm 2\%$

##### COMPONENT 2

Output impedance	: 75 ohms
Output video amplitude	: 100/0/100/0 color bars
Luminance with sync	: 1.0 V p-p $\pm 2\%$
Color difference	: 0.7 V p-p $\pm 2\%$

### Composite input/output parameters

#### Input

	: 75 ohms
Input impedance	: 1 V p-p
Reference video amplitude	

#### Output

	: 75 ohms
Output impedance	: 1 V p-p
Composite video amplitude	

### Longitudinal audio characteristics (metal tape)

#### Frequency response

20 dB below peak level (peak level = +8 dB above *operational level)	: 50 Hz to 15.0 kHz $\begin{smallmatrix} +1.0 \\ -2.0 \end{smallmatrix}$ dB
--	---

#### Signal-to-noise ratio

Referred to peak level (peak level = +8 dB above *operational level)	: More than 68 dB (weighted CCIR 468-3)
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Distortion K3 at peak level (peak level = +8 dB above*operational level)	: Less than 3% (at 1 kHz)
--	---------------------------

Wow and flutter (DIN 45507)	: Less than 0.1%
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Crosstalk	: More than 71 dB (at 1 kHz)
-----------	------------------------------

Stereo phase	: $\pm 20^\circ$ (at 15 kHz)
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### FM audio characteristics (metal tape only)

#### Frequency response

20 dB below peak level (peak level = +19 dB above *operational level)	: 20 Hz to 20.0 kHz $\begin{smallmatrix} +0.5 \\ -2.0 \end{smallmatrix}$ dB
---	---

#### Signal to noise ratio

Referred to peak level (peak level = +19 dB above *operational level)	: More than 72 dB (weighted CCIR 468-3)
---	---

Distortion K3 at* operational level (0 VU)	: Less than 0.5% (at 1 kHz)
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Crosstalk	: More than 70 dB (100 Hz to 12.5 kHz)
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Stereo phase	: $\pm 10^\circ$ (at 20 kHz)
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**Longitudinal audio characteristics (oxide tape): without A.N.R**

**Frequency response**

20 dB below peak level (peak level = +8 dB : 50 Hz to 15.0 kHz  $\pm 3$  dB  
above \*operational level)

**Signal-to-noise ratio**

Referred to peak level (peak level = +8 dB : More than 62 dB (weighted CCIR 468-3) (with A.N.R.)  
above \*operational level)

Distortion K3 at peak level (peak level = +8 dB : Less than 3% (at 1 kHz)  
above \*operational level)

Wow and flutter (DIN 45507) : Less than 0.1%

Crosstalk : More than 60 dB (at 1 kHz)

Stereo phase :  $\pm 45^\circ$  (at 15 kHz)

**Output parameters**

**Output**

Audio line output level :  $-\infty$  to +14 dBu (nominal: +4 dBu), 600 ohms,  
balanced

Monitoring output level :  $-\infty$  to +14 dBu (nominal: +4 dBu), 600 ohms,  
balanced

Headphones output level :  $-\infty$  to -12 dBu, 8 ohms, unbalanced

**Processor adjustment range**

Video level :  $\pm 3$  dB

Chroma level :  $\pm 3$  dB

Black level :  $\pm 100$  mV

System SC phase :  $360^\circ$  p-p

System sync phase :  $\pm \frac{3}{1} \mu s$  (fine adjustment range 300 ns)

Y/C delay :  $\pm 50$  ns

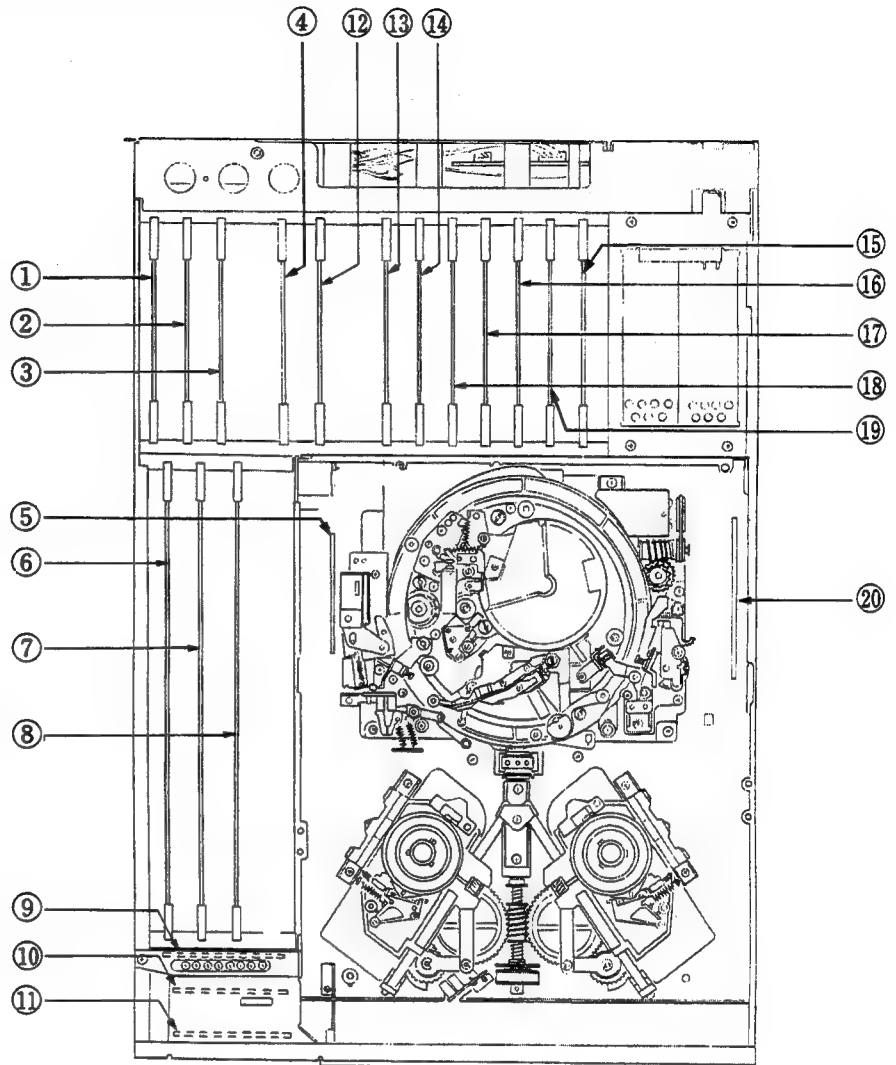
\* Operational level = 4 dBm

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The output level of a component signal conforms to the EBU N-10 standard.

## 2-2. LOCATION OF THE PRINTED CIRCUIT BOARDS

### TOP VIEW

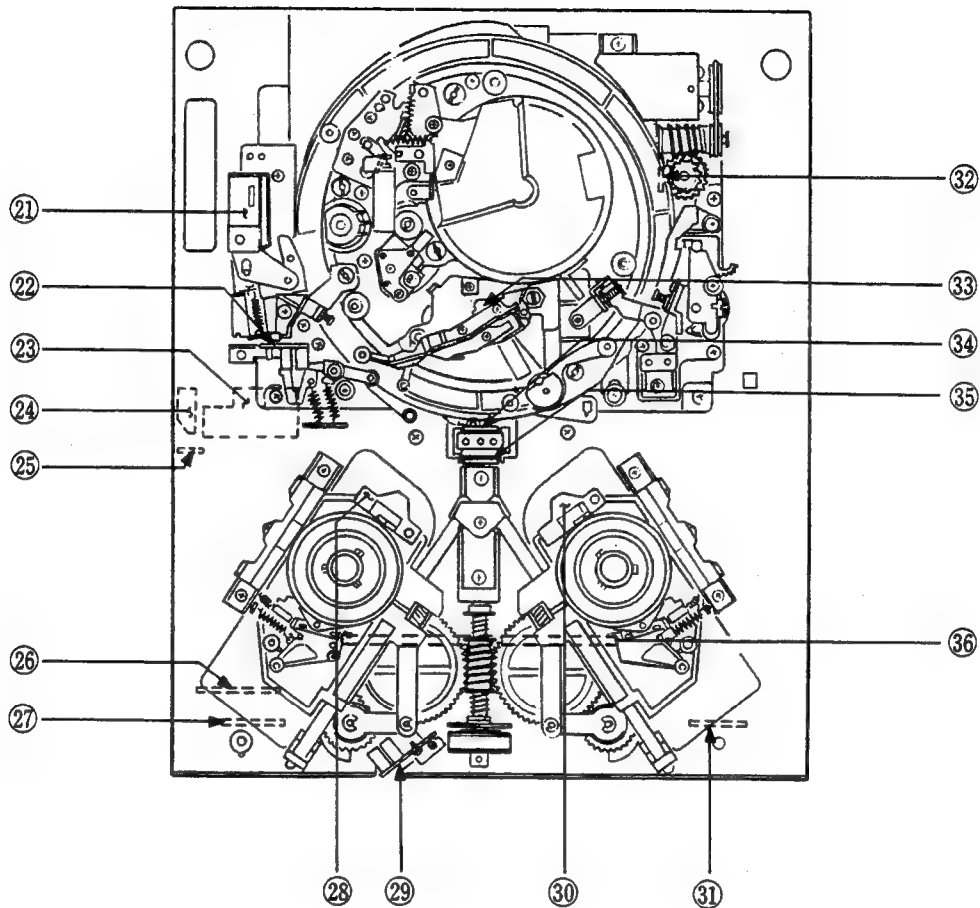


- ① TBC-9P Board
- ② EN-48P Board
- ③ VO-18AP Board
- ④ DEC-39A Board  
(Serial No. up to 10669)  
DEC-46AP Board  
(Serial No. 10670 and higher)
- ⑤ DT-15 Board

- ⑥ TBC-8P Board  
(Serial No. up to 10769)  
TBC-12P Board  
(Serial No. 10770 and higher)
- ⑦ TBC-7E Board
- ⑧ DM-56P Board
- ⑨ BF-28A Board
- ⑩ DP-73 Board
- ⑪ DP-74 Board

- ⑫ AFM-1A Board
- ⑬ AU-118P Board
- ⑭ TC-40AP Board
- ⑮ DT-14P Board
- ⑯ DT-13 Board
- ⑰ SV-84P Board
- ⑱ SV-83B Board
- ⑲ SV-82A Board
- ⑳ SE-57 Board

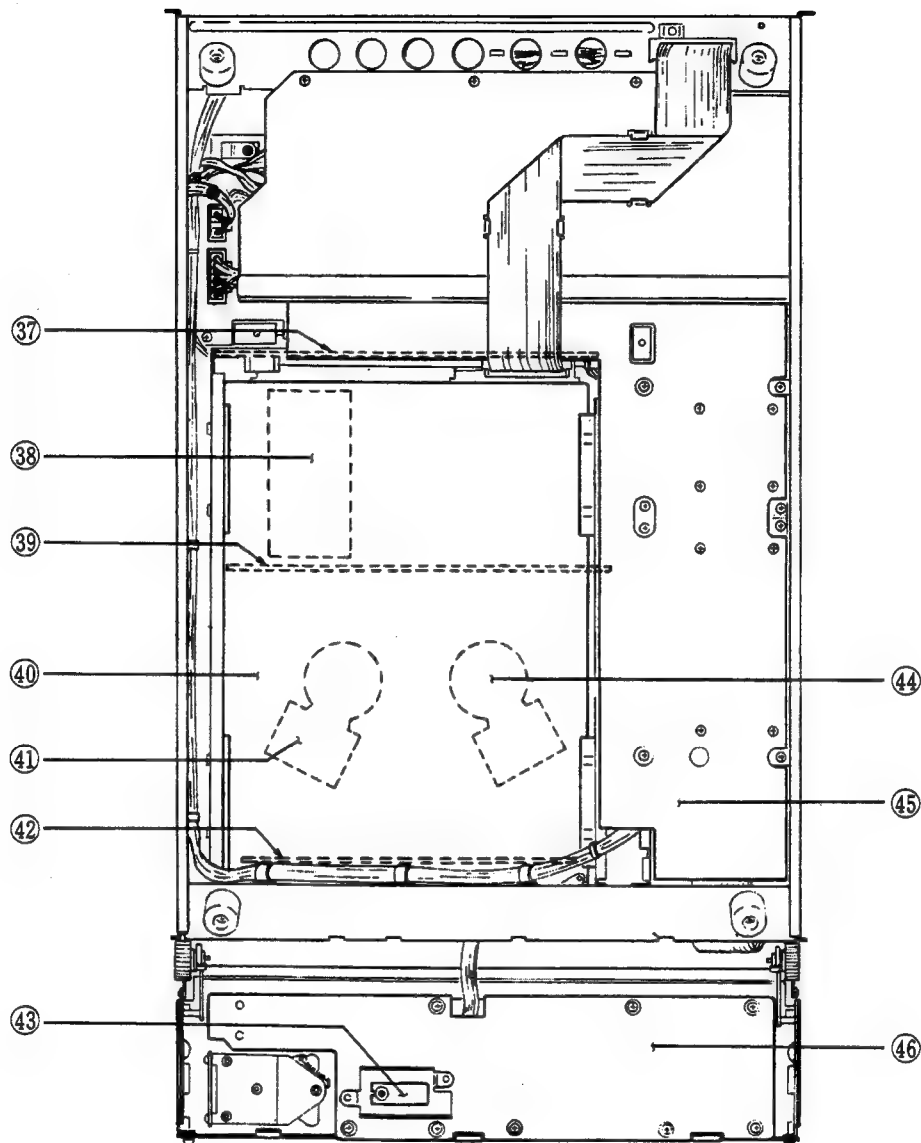
TOP VIEW



- |  |  |
|--|--|
| ②① PD-35 Board                           | ②⑧ DE-15 Board                           |
| ②② PTC-15 Board                          | ②⑨ PTC-21 Board                          |
| ②③ CL-14 Board (Cassette-up Compartment) | ③① DE-15 Board                           |
| ②④ PC-33 Board (Cassette-up Compartment) | ③② PC-41 Board (Cassette-up Compartment) |
| ②⑤ PC-33 Board (Cassette-up Compartment) | ③③ PTC-31 Board                          |
| ②⑥ PC-32 Board (Cassette-up Compartment) | ③④ TR-18 Board                           |
| (Serial No. up to 10191)                 | ③⑤ PTC-20 Board                          |
| PC-47 Board (Cassette-up Compartment)    | ③⑥ PTC-36 Board                          |
| (Serial No. 10192 and higher)            | ③⑦ CL-24 Board (Cassette-up Compartment) |
| ②⑦ PC-41 Board (Cassette-up Compartment) | (Serial No. 12112 and higher)            |

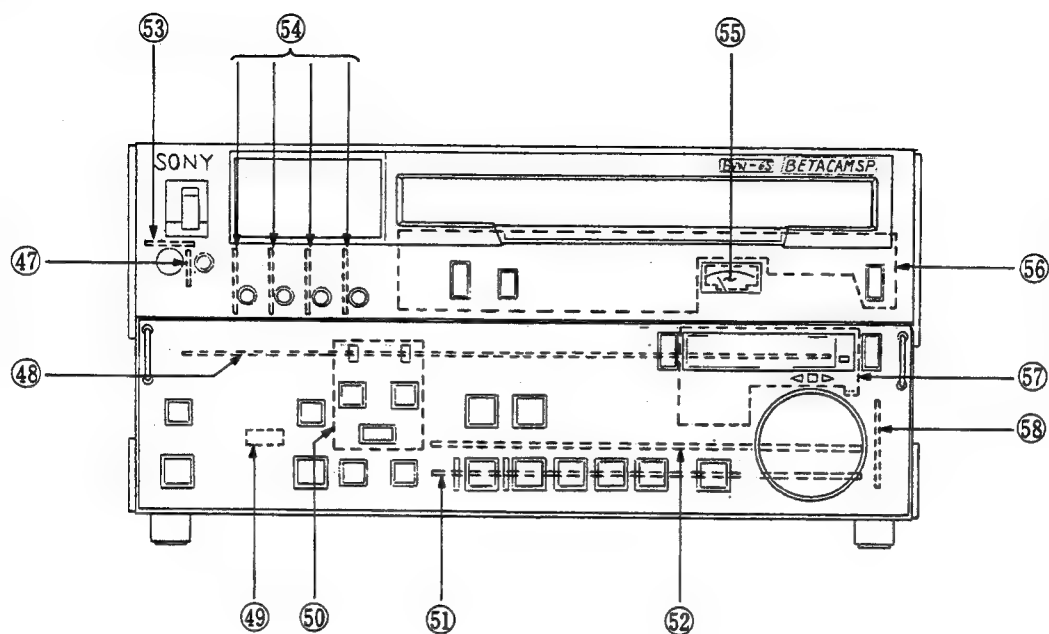


**BOTTOM VIEW**

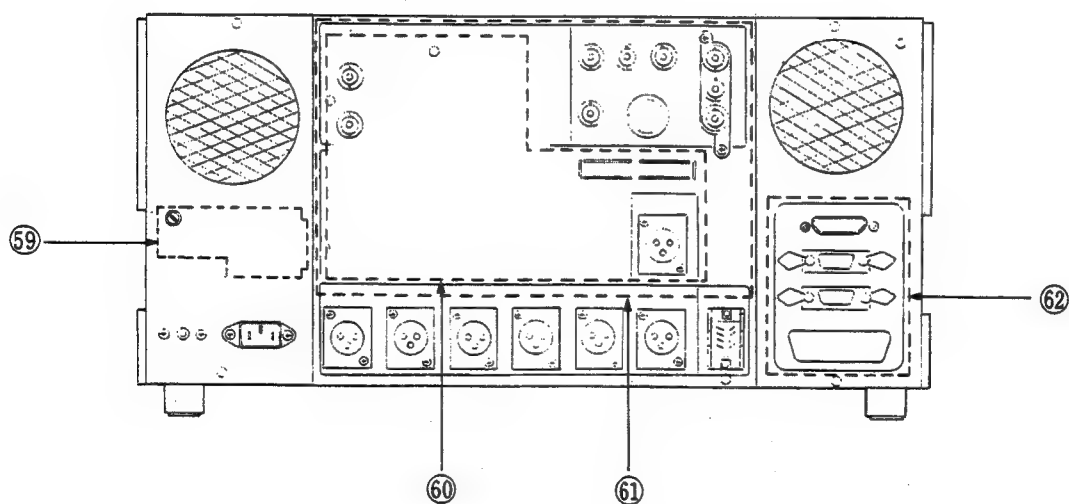


- ③⑦ MB-192 Board
- ③⑧ RE-28 Board
- ③⑨ DR-56 Board
- ④① SY-61A Board
- ④② RM-40 Board
- ④③ RE-36 Board
- ④④ PT-9 Board
- ④⑤ RM-40 Board
- ④⑥ MB-191B Board
- ④⑦ KY-96B Board

# FRONT VIEW



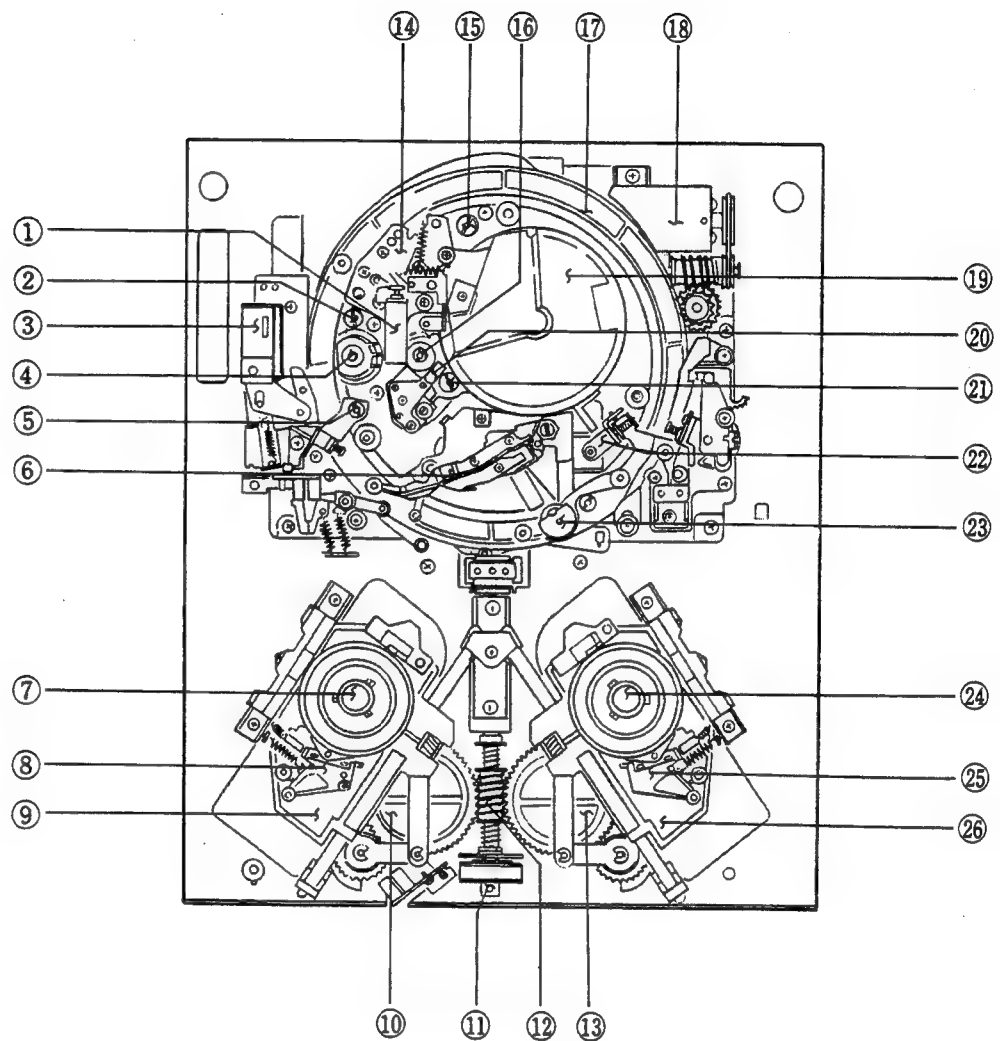
# REAR VIEW



- |                  |                 |                               |
|------------------|-----------------|-------------------------------|
| ④ HP-33 Board    | ⑤ VR-62 Board   | ⑨ AC-81 Board                 |
| ④ CP-103AP Board | ⑤ VR-42 Board   | (Serial No. up to 10191)      |
| ④ HC-11 Board    | ⑤ DP-72 Board   | AC-96 Board                   |
| ⑤ KY-107 Board   | ⑥ SW-144A Board | (Serial No. 10192 and higher) |
| ⑥ SY-61A Board   | ⑦ DP-71A Board  | ⑩ CP-101AP Board              |
| ⑥ SY-64AP Board  | ⑧ PTC-32 Board  | ⑪ CP-111/CP-161A Board        |
|                  |                 | ⑫ RM-57 Board                 |

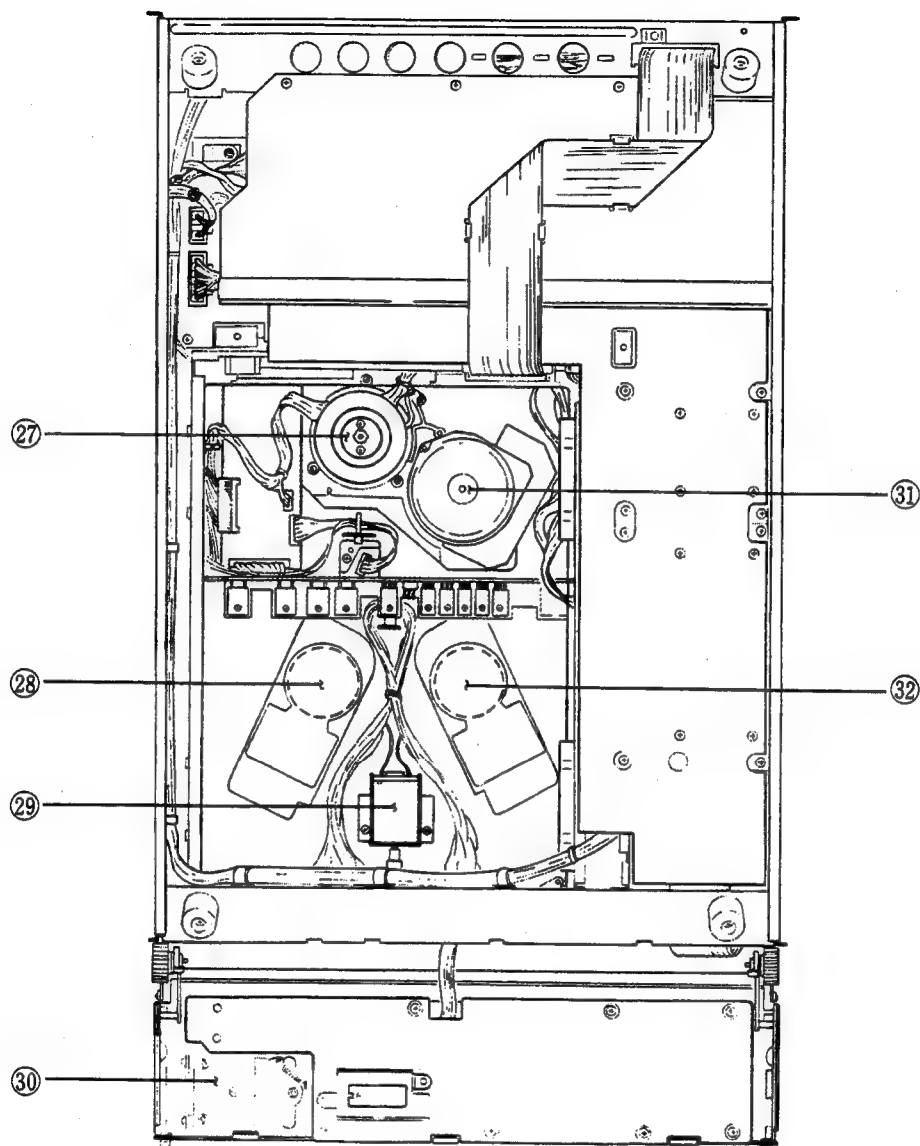
## 2-3. LOCATION OF THE MAIN MECHANICAL PARTS/COMPONENTS

### TOP VIEW



- |                         |                       |                       |
|-------------------------|-----------------------|-----------------------|
| ① Cleaning Roller Block | ⑩ Supply Worm Wheel   | ⑲ Head Drum           |
| ② TG-4                  | ⑪ Timing Pulley       | ⑳ CTL Head            |
| ③ Pinch Solenoid        | ⑫ Worm Gear           | ㉑ TG-2                |
| ④ Capstan Shaft         | ⑬ Take-up Worm Wheel  | ㉒ T Drawer Arm        |
| ⑤ TG-0                  | ⑭ Audio/TC Head Block | ㉓ Pinch Roller        |
| ⑥ S Tension Regulator   | ⑮ TG-3                | ㉔ Take-up Reel Table  |
| ⑦ Supply Reel Table     | ⑯ TG-1                | ㉕ Take-up Brake Ass'y |
| ⑧ Supply Brake Ass'y    | ⑰ Threading Ring      | ㉖ Take-up Motor Plate |
| ⑨ Supply Motor Plate    | ⑱ Gear Box            |                       |

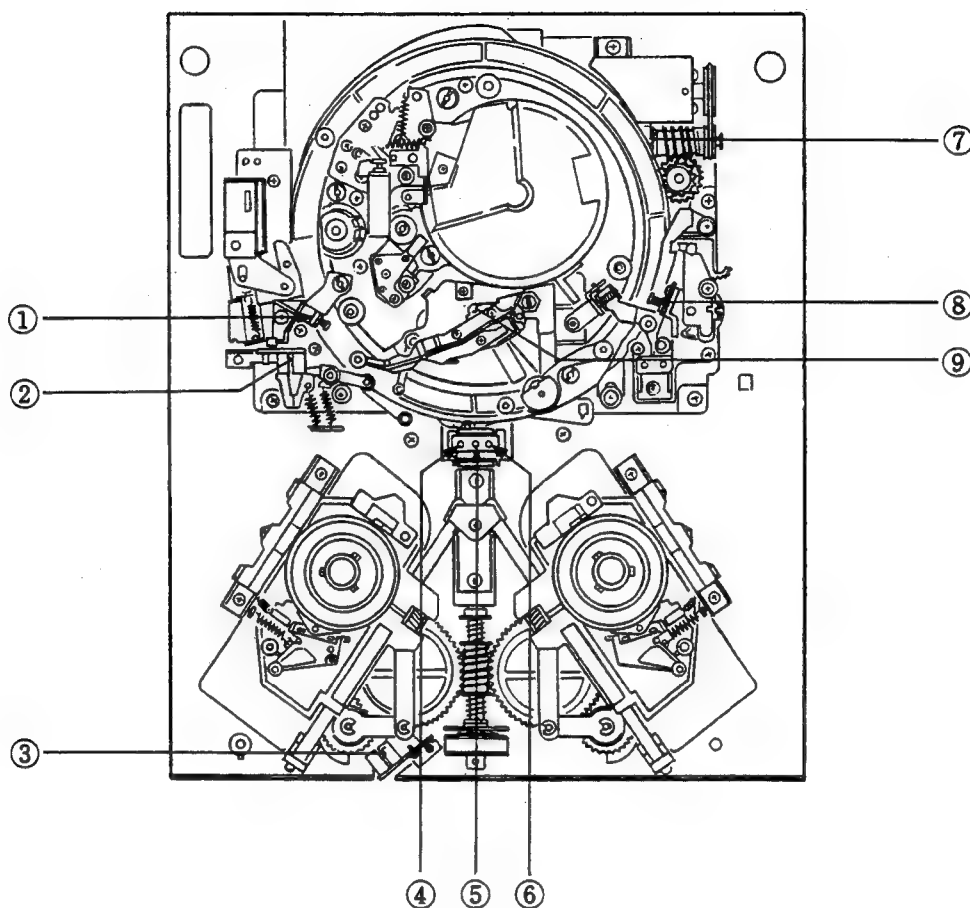
**BOTTOM VIEW**



- ②⑦ Drum
- ②⑧ Take-up Reel Motor
- ②⑨ Reel Transfer Motor
- ③⑩ Search Dial Block
- ③① Capstan Motor
- ③② Supply Reel Motor

## 2-4. LOCATION OF THE SENSORS

### TOP VIEW

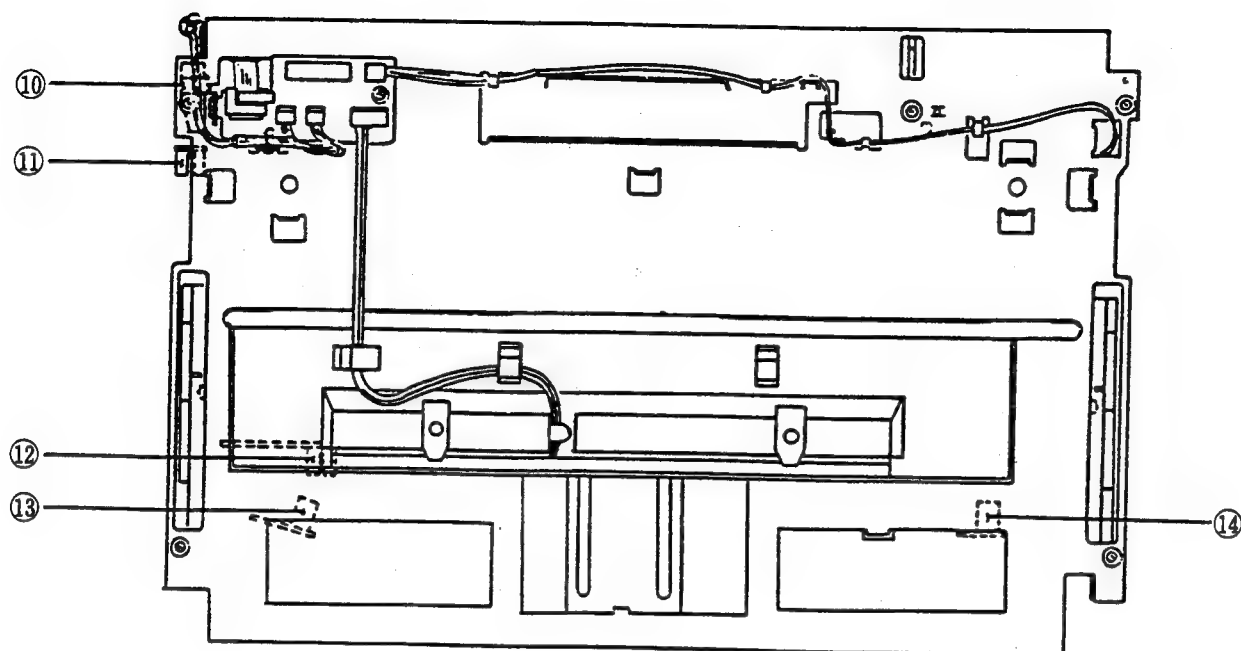


- ① Tape End Sensor
- ② Ring Sensor
- ③ Reel Table L/S Position Detection Sensor
- ④ Reel Hub Diameter Detection Switch
- ⑤ Oxide/Metal Particle Tape Detection Switch

- ⑥ Video Tape Thickness Detection Switch
- ⑦ Threading Speed Detection Sensor
- ⑧ Tape Beginning Sensor
- ⑨ Tape Tension Sensor

\* The "S cassette" or "small cassette" described in the Maintenance Manual indicates a standard cassette.

**TOP VIEW OF THE CASSETTE-UP COMPARTMENT**



- ⑩ Cassette-down Switch (2)
- ⑪ Cassette-down Switch (1)
- ⑫ Cassette L/S Size Detection Switch
- ⑬ Cassette-in Switch (L)
- ⑭ Cassette-in Switch (R)

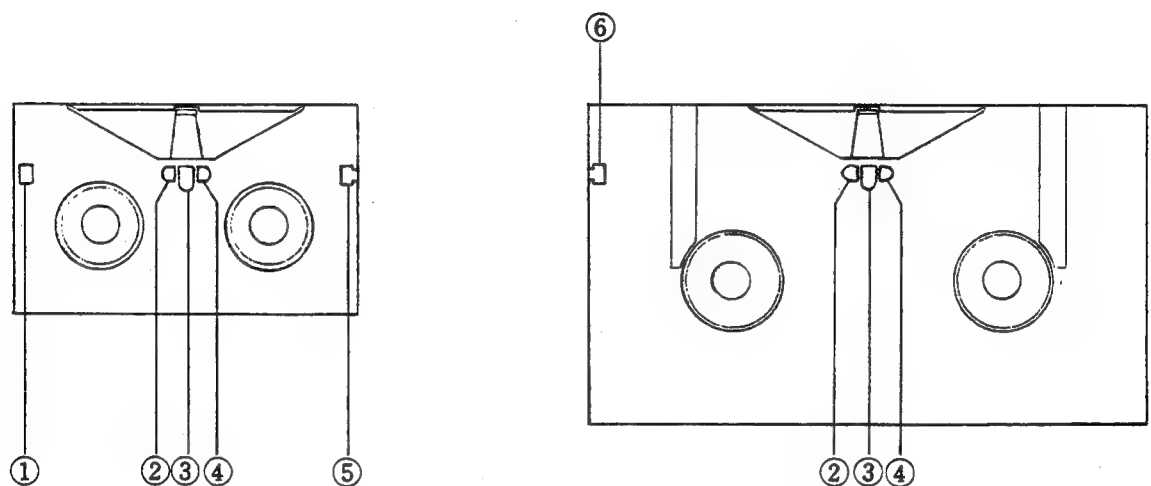
## 2-5. FUNCTIONS OF THE SENSORS AND CASSETTE TAB

### 2-5-1. Function of the Sensors

1. Reel Table L/S Position Detection Sensor  
(Sec. 2-4- ③ )
  - . The sensor detects whether the Reel Table moves to the correct position according to the size of the inserted cassette.
2. Ring Sensor  
(Sec. 2-4 ② )
  - . The sensor detects whether the Threading Ring reaches the THREAD END or UNTHREAD END position.
3. Tape Tension Sensor  
(Sec. 2-4- ⑨ )
  - . During playback, a tension arm is activated to keep a constant tape tension at the drum entrance. The Tape Tension Sensor detects the position of the tension arm.
4. Threading Speed Detection Sensor  
(Sec. 2-4- ⑦ )
  - . During threading, the Threading Ring rotation speed is controlled using a servo circuit to protect the tape from damage. The Threading Ring rotation speed is detected using the Threading Speed Detection Sensor installed into the Gear Box Block.
5. Reel Hub Diameter Detection Switch  
(Sec. 2-4- ④ )
  - . The reel hub diameter varies depending on the length of the tape wound on a cassette. The diameter is detected using the Reel Hub Diameter Detection Switch. The resultant data is sent to the servo circuit.
6. Oxide/Metal Particle Tape Detection Switch  
(Sec. 2-4- ⑤ )
  - . This switch detects whether an oxide tape or a metal particle tape is being used.
7. Video Tape Thickness Detection Switch  
(Sec. 2-5- ⑥ )
  - . This switch detects the thickness of the video tape wound on a cassette.
8. Cassette L/S Size Detection Switch  
(Sec. 2-4- ⑫ )
  - . This switch detects whether the inserted cassette is large or small.
9. Cassette-in Switch (L)/Cassette-in Switch (R)  
(Sec. 2-4- ⑬ , ⑭ )
  - . This switch detects whether a cassette is being inserted.
10. Cassette-down Switch (1)  
(Sec. 2-4- ⑪ )
  - . This switch detects whether a cassette is inserted and the Cassette-up Compartment goes down.
  - . It detects whether the Cassette-up Compartment goes up in the EJECT mode.
11. Cassette-down Switch (2)  
(Sec. 2-4- ⑩ )
  - . This switch checks whether the Reel Table moves to the correct position according to the size of the inserted cassette.

## 2-5-2. Function of the Cassette Plug and Tab

As shown in the figure below, plugs and tabs are provided at the back of the video cassette.



- ① Small cassette's miss-REC (for Oxide tape)
- ② Vide tape thickness detection
- ③ Oxide/Metal tape detection
- ④ Reel hub diameter detection
- ⑤ Small cassette's miss-REC (for Metal tape)
- ⑥ Large cassette's miss-REC

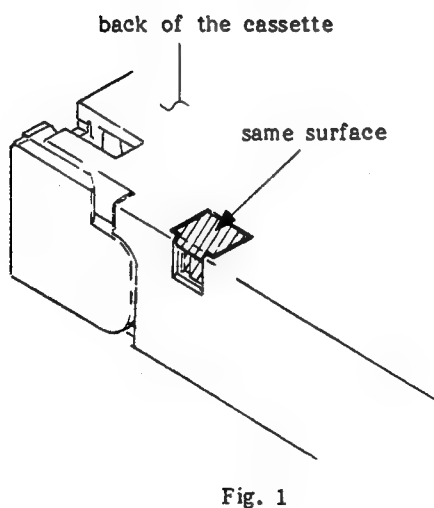


Fig. 1

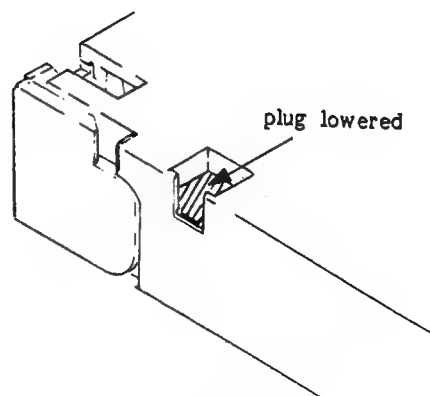


Fig. 2



The presence or absence of these plugs and tabs determines the cassette status as shown in the table below.

Plug and tab	Cassette status with plugs and tabs	Cassette status without plugs and tabs
Small cassette miss-REC (for oxide tape)	Can be recorded.	Cannot be recorded. * When recording is required, cover the former location of the tab with vinyl tape.
Small cassette miss-REC (for metal particle tape)	Can be recorded (the plug is located on the same surface as the back of the cassette) (refer to Fig. 1).	Cannot be recorded (the plug is lower than the back of the cassette) (refer to Fig. 2). * When recording is required, raise the plug.
Large cassette miss-REC	Can be recorded (the plug is located on the same surface as the back of the cassette) (refer to Fig. 1).	Cannot be recorded (the plug is lower than the back of the cassette) (refer to Fig. 2). * When recording is required, raise the plug.
Tape thickness	A 20um thick tape is wound on the cassette.	A 15um thick tape is wound on the cassette.
Oxide/Metal tape detection	An oxide tape is wound on the cassette.	A metal particle tape is wound on the cassette.
Reel hub diameter	For small hub	For large hub

## 2-6. PRINTED CIRCUIT BOARDS

The circuit information is provided below.

System	Board	Circuit function	System	Board	Circuit function
VIDEO	DM-56P	Y/C Demodulator	AUDIO	HP-33	Headphones Amplifier/Jack
	DUS-259	Metal/Oxide LPF Switch		VR-62	Headphones Level Volume
	DUS-269	C RF Phase EQ.		DP-74	Audio Level Meter
	DUS-288	DO RF EQ.		DP-73	DC-AC/DC Converter
	*3			SW-144A	Select Switch/Display
	EQ-26 *3	RF EQ.		DP-72	RF Meter LED
	EQ-28 *3	RF EQ.	SERVO	SV-82A	Microcomputer Servo
	TBC-7E	Time Base Corrector		SV-83B	Reel Servo
	SW-261	Metal/Oxide Y/C Delay		SV-84P	Capstan/Drum Servo
	*2	Adjust		RE-28	Capstan/Drum Motor Driver
	TBC-8P *6	Time Base Corrector		PTC-20	Cassette Detector (Tape Thickness, Reel Hub Diameter, Metal/Oxide)
	NR-25	Y Digital Noise Reduction		PTC-36	Cassette Detector (Tape Thickness, Reel Hub Diameter, Metal/Oxide)
	*6			PTC-21	Reel Table Position Detector
	TBC-12P	Time Base Corrector		DR-56	Drum Error Amplifier, Capstan/Reel Motor Driver
	*7			RE-36	Reel Motor Driver
	NR-32	Y Digital Noise Reduction, Read Clock Generator		RM-40	Reel Motor
	*7			DE-15	Reel Motor FG
	TBC-9P	Time Base Corrector		SE-57	Threading Motor Control
	EN-48P	C Encoder		PTC-31	Threading Motor FG
	VO-18AP	Video Output		TR-18	Tape Tension Sensor
	DUS-270	Squelch Buffer		DT-13	Dynamic Tracking
	DEC-39A	Edge Detector		DT-14P	Dynamic Tracking
	*4			DUS-282	Strain Gage Buffer
	DEC-46AP	Edge Detector		*1	
	*5			DT-15	Dynamic Tracking
	CP-103AP	Sub Control Panel			
	CP-101AP	REF Video Input			
AUDIO	AU-118P	LNG Audio Head Amplifier			
	AFM-1A	AFM Audio Demodulator			
	FL-61	Low-Pass Filter			
	BF-28A	Audio Buffer/Level Detector			
	VR-42	Audio PB Volume			
	CP-111	Audio Output			
	CP-161A	Amplifier/Driver			
	CP-113	Audio Balanced Amplifier			

System	Board	Circuit function
SYSTEM CONTROL	SY-61A	System Control
	SY-64AP	Time Code Reader
	PD-35	Pinch/Cleaning Solenoid
	PTC-15	Thread/Unthread End Sensor
	RM-57	Remote Connector
	CL-14	Cassette-up Compartment
	CL-24*8	Cassette-up Compartment LED
	PC-32*2	Large/Small Cassette Detector
	PC-47*3	Large/Small Cassette Detector
	PC-33	Cassette DOWN Detector
	PC-41	Cassette IN Detector
	CCM-2	UP/Down Motor
	HC-11	Hours Meter
	KY-96B	Keyboard
	KY-107	Keyboard
	PTC-32	Search Dial
	DP-71A	Time Counter Display
	PT-9	Power Transistor
	TC-40AP	LTC PB Amplifier
OTHERS	AC-81*2	Relay Board of AC Inlet
	AC-96*3	Relay Board of AC Inlet
	M1	Switching Regulator
	M2	Switching Regulator
	C1	Switching Regulator
	C2	Switching Regulator
	MB-191B	Mother Board
	MB-192	Mother Board
	EX-116	Extension Board
	EX-134	Extension Board
	EX-151	Extension Board

\*1...Serial No. 10161 and higher

\*2...Serial No. up to 10191

\*3...Serial No. 10192 and higher

\*4...Serial No. up to 10669

\*5...Serial No. 10670 and higher

\*6...Serial No. up to 10769

\*7...Serial No. 10770 and higher

\*8...Serial No. 12112 and higher

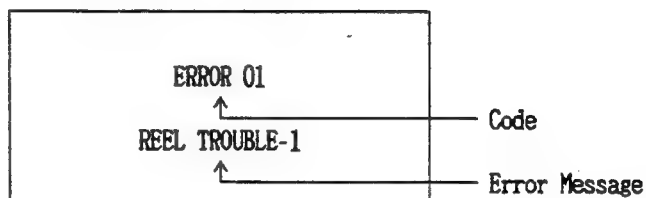
## 2-7. SELF DIAGNOSIS FUNCTION

The unit has a self diagnosis to isolate the troubles described below. When the troubles are detected, an error message is displayed on the function control panel's time counter display and monitor television. (To display the error message on the monitor television, connect a monitor television to the VIDEO OUT-3 connector on the connector panel and set the CHARACTER ON/OFF switch on the SY-61A board to on.)

Time counter display on the function control panel

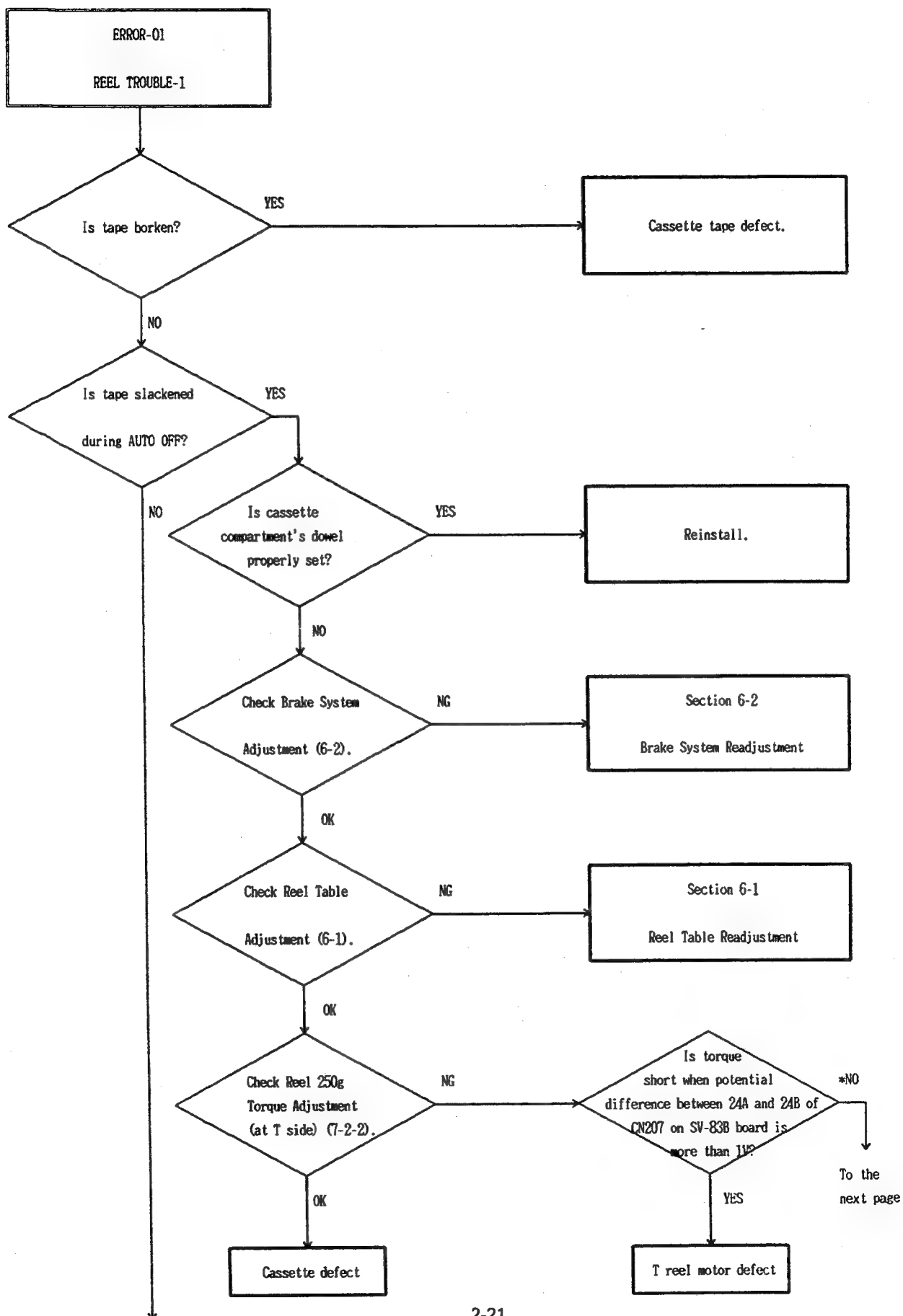


Character display

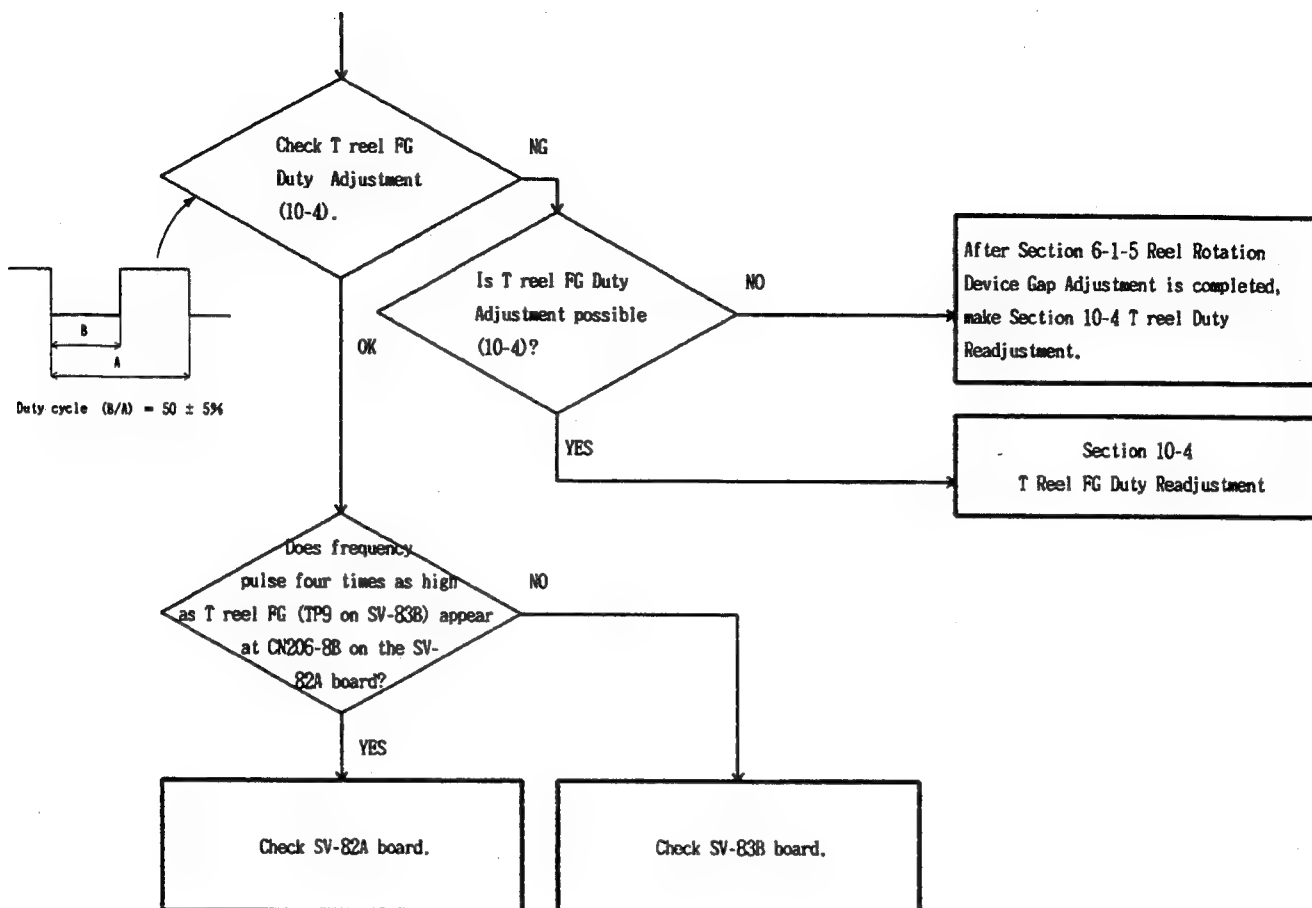


Code	Error message	Description	Detection
01	REEL TROUBLE-1	When tape slacking is detected during unthreading or tape breaking is detected during threading, tape protection operation is done and this message is displayed.	Detected when the ratio of the FG frequency at a take-up reel and threading ring is less than the specified value.
02	REEL TROUBLE-2	When tape slacking is detected in REC, SEARCH, F.FWD, and REW modes, tape protection operation is done and this message is displayed.	Detected when the ratio of the FG frequency at a supply reel and take-up reel is less than the specified value.
03	REEL TROUBLE-3	When tape slacking is detected in PLAY mode, tape protection operation is done and this message is displayed.	Detected when the ratio of the FG frequency at a capstan motor and take-up reel motor is less than the specified value or when the tension detected from a tension sensor is less than 15g.
04	REEL TROUBLE-4	When the tape does not run at the speed designated in F.FWD and REW modes, tape protection operation is done and this message is displayed.	Detected when the tape speed using the FG frequency at supply and take-up reels is compared with the designated speed.
05	REEL TROUBLE-5	Detected when the supply and take-up reels cannot be stopped with the cassette not inserted.	Detected using the FG frequency at supply and take-up reels.
06	TAPE TENSION ERROR	When excessive tension is detected, tape protection operation is done this message is displayed.	Detected when the tension detected from a tension sensor is more than 55g.
07	CAPSTAN TROUBLE	When the tape does not run at the speed designated in PLAY and SEARCH modes, tape protection operation is done and this message is displayed.	Detected at the tape speed detected from the FG frequency at a capstan motor.
08	DRUM TROUBLE	When drum motor rotation is not normal, tape protection operation is done and this message is displayed.	Detected when the drum speed obtained from the drum motor's phase PG and speed PG is less than the specified value or when the drum servo is not locked for more than the specified time.
09	TH/UNTH MOTOR TIME OUT	When threading or unthreading is not completed, tape protection operation is done and this message is displayed.	Detected when threading or unthreading is not completed within ten seconds after it is started.
0A	THREADING TROUBLE	When threading cannot be done, tape protection operation is done and this message is displayed.	Detected when the FG frequency at a take-up reel cannot be detected during threading or the tape beginning sensor is activated after the short FF mode is automatically entered three times.
10	H U M I D	Displayed when humid condensation is detected.	Detected using a condensation sensor.
11	TAPE BEGINNING/END SENSOR	Displayed when the tape beginning and end sensor operation is defective.	Detected when the tape beginning and end are detected at the same time.
12	TAPE BEGINNING SENSOR TROUBLE	Displayed when the tape beginning sensor operation is defective.	Detected when the tape beginning continues for more than seven seconds.
13	TAPE END SENSOR TROUBLE	Displayed when the tape end sensor operation is defective.	Detected when the tape end continues for more than seven seconds.

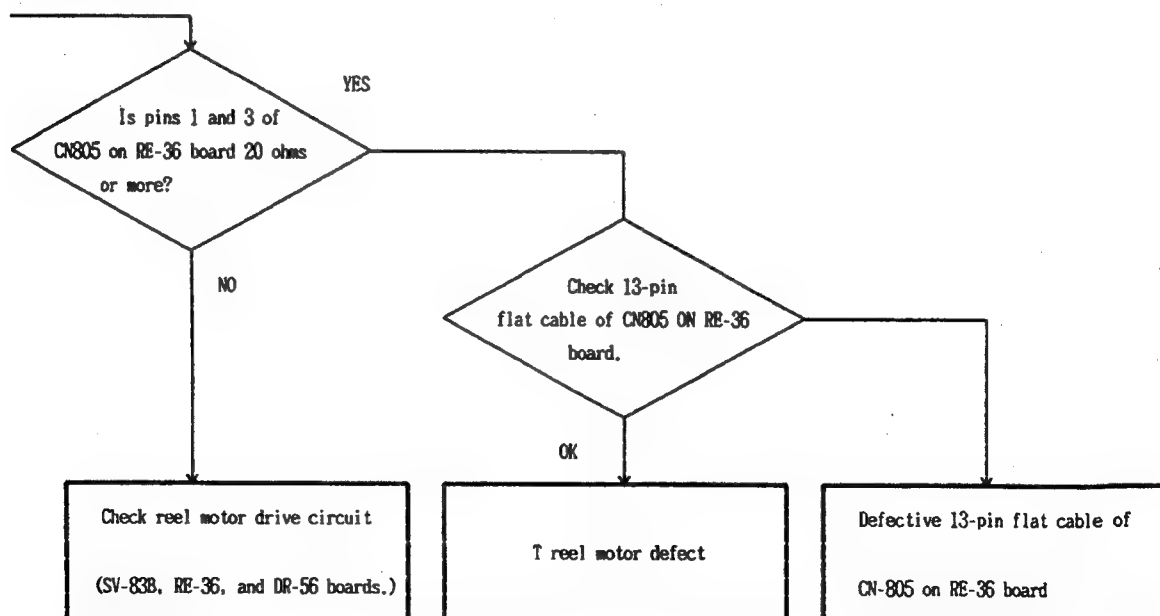
Code	Error message	Description	Detection
14	FAN MOTOR TROUBLE	Displayed when the operation of the fan motor on the connector panel is defective.	Detected according to the period of a ripple noise at the fan motor terminal.
20	C A S S E T T E C O M P A R T M E N T M O T O R L O C K	When cassette up/down operation is not completed, tape protection is done and this message is displayed.	Detected when cassette up/down operation is not completed within four seconds after it is started.
21	REEL TABLE MOTOR LOCK TROUBLE	When driving of L to S or S to L in the reel table is not completed, tape protection operation is done and this message is displayed.	Detected when reel table driving is not completed within four seconds after it is started.
22	REEL TABLE SENSOR TROUBLE	Displayed when reel table's L/S position detection sensor operation is defective.	Detected when the large and small positions are detected at the same time.
23	THREADING RING SENSOR TROUBLE	Displayed when defects occur in the threading ring's position detection.	Displayed when defects occur in the threading ring's position detection.
90	KEY INTERFACE ERROR-1	Displayed when the interface between the keyboard and system control is defective.	Detected when no interface signal is sent from the system control to the keyboard.
92	SERVO INTERFACE ERROR-1	Displayed when the interface between the keyboard and system control is defective.	Detected when no interface signal is sent from the servo system to the system control.
93	SERVO INTERFACE ERROR-2	Displayed when the interface between the keyboard and system control is defective.	Detected when no interface signal is sent from the system control to the servo system.
95	SY CPU INTERFACE ERROR	Displayed when the interface between CPU1 and CPU2 on the SY-61A board is defective.	Detected when data is not receive or sent properly between CPU1 and CPU2 during power on sequence.
96	NV-RAM TROUBLE	Displayed when a defective NV-RAM is detected on the SY-61A board.	Detected by the NV-RAM data's checksum.



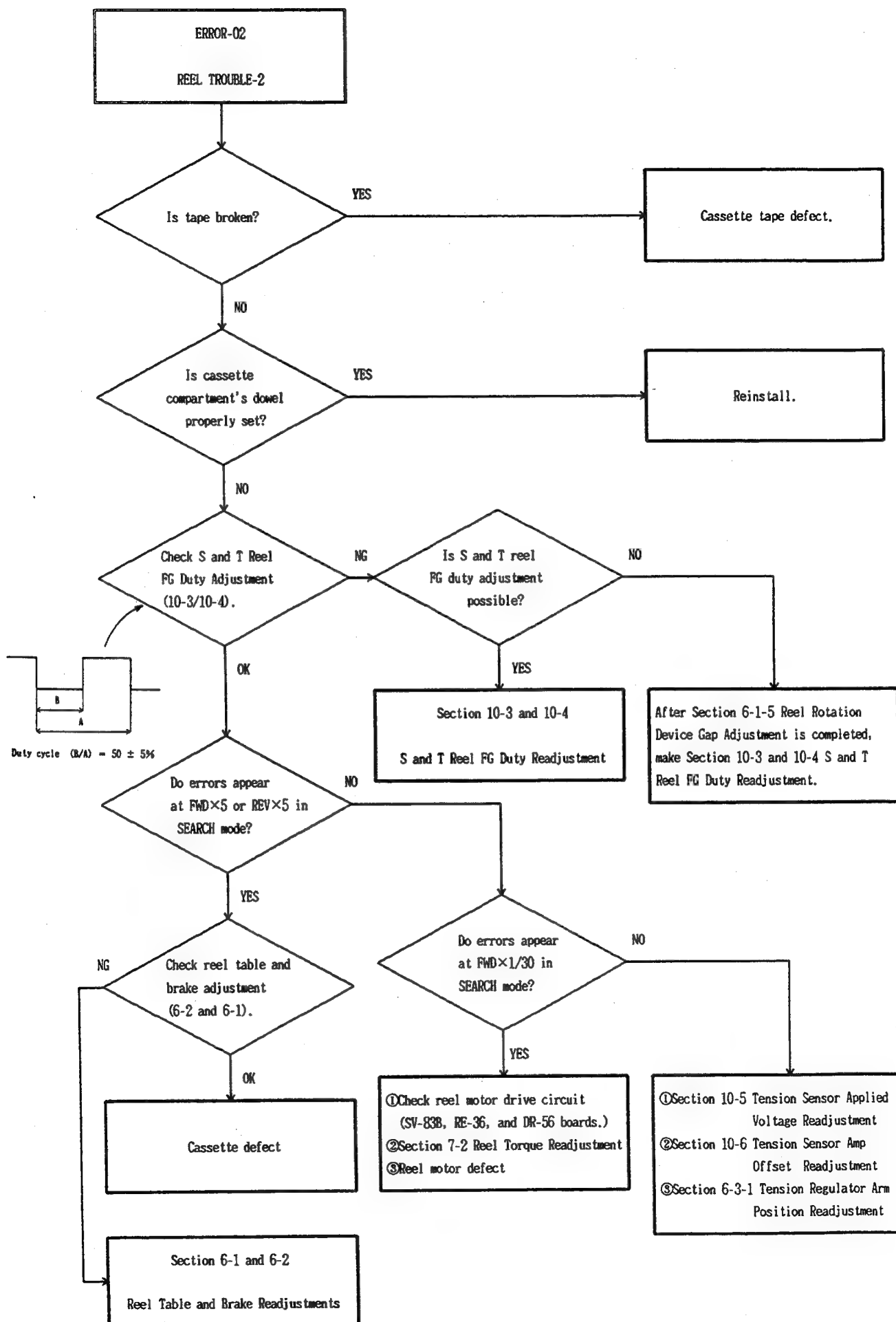
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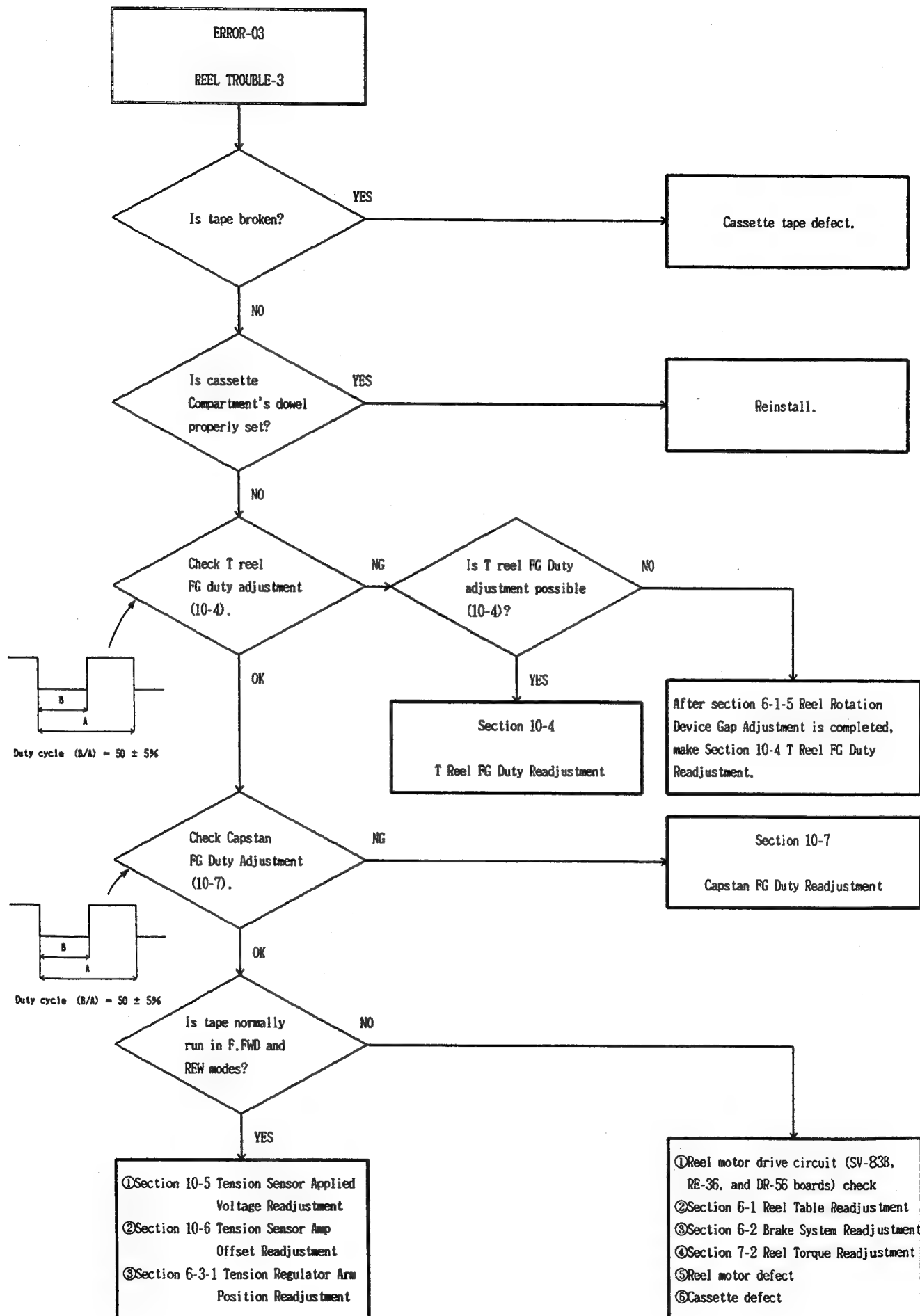


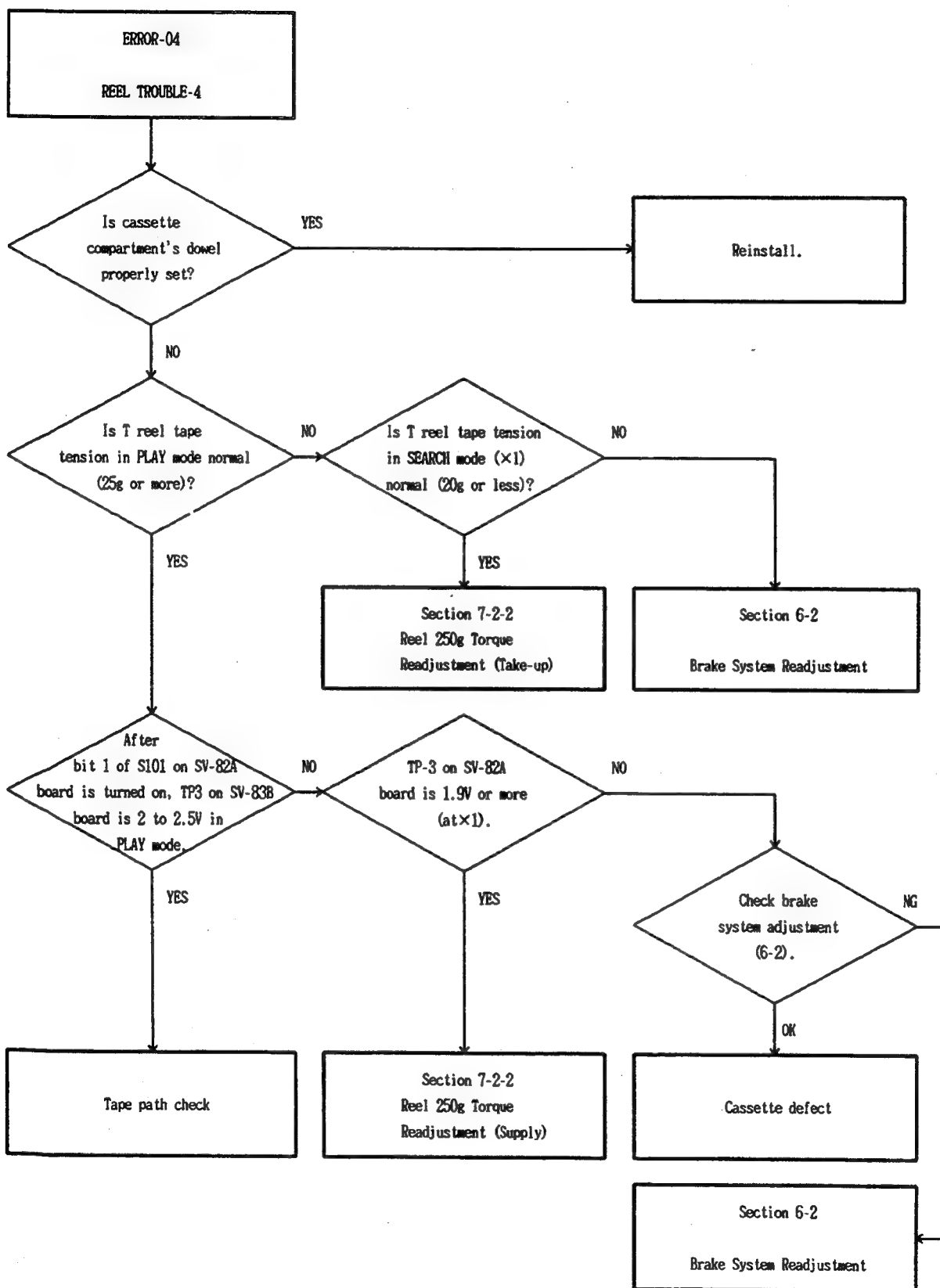
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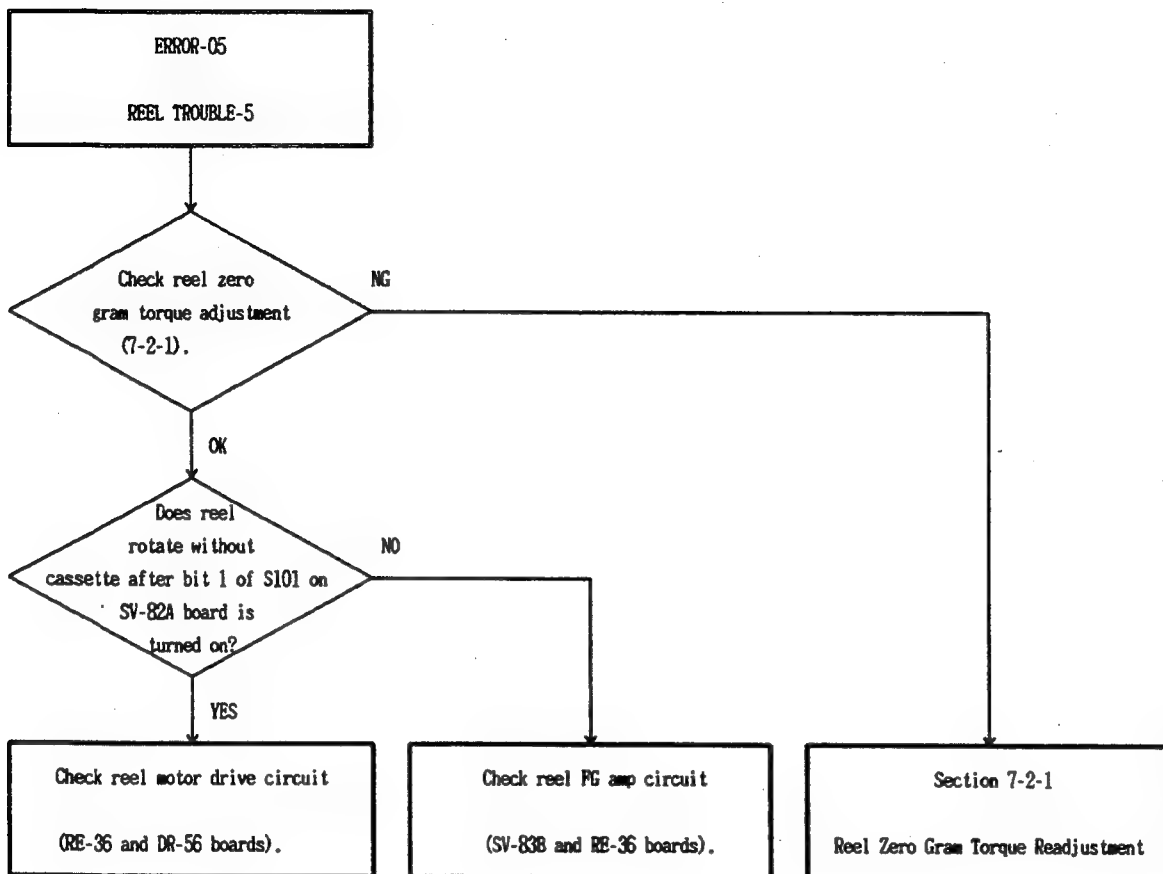


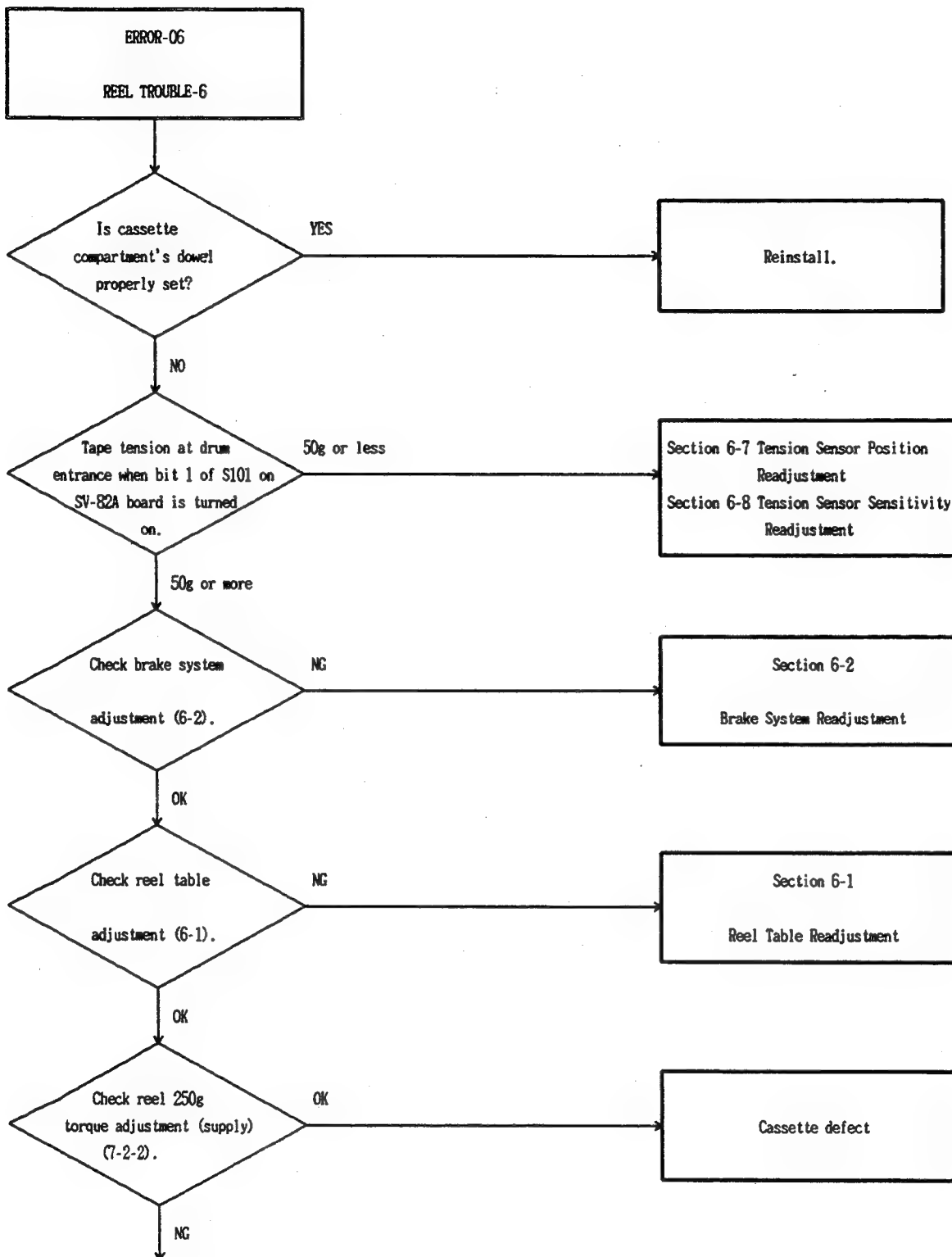


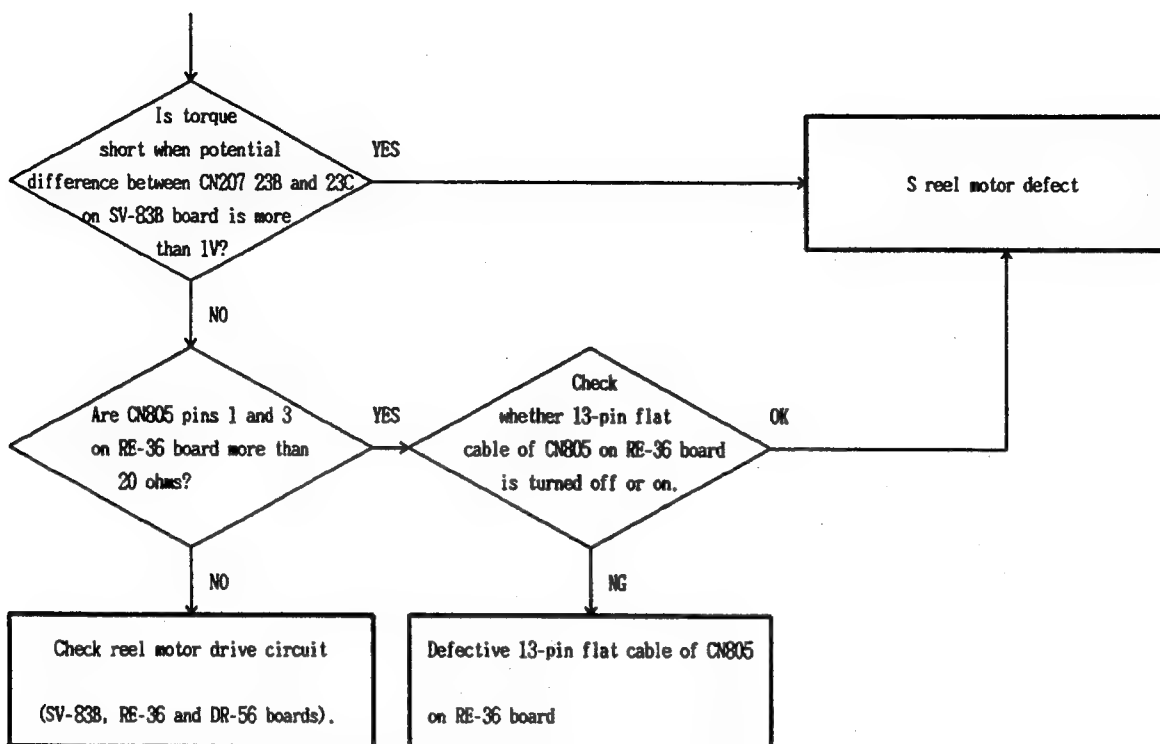


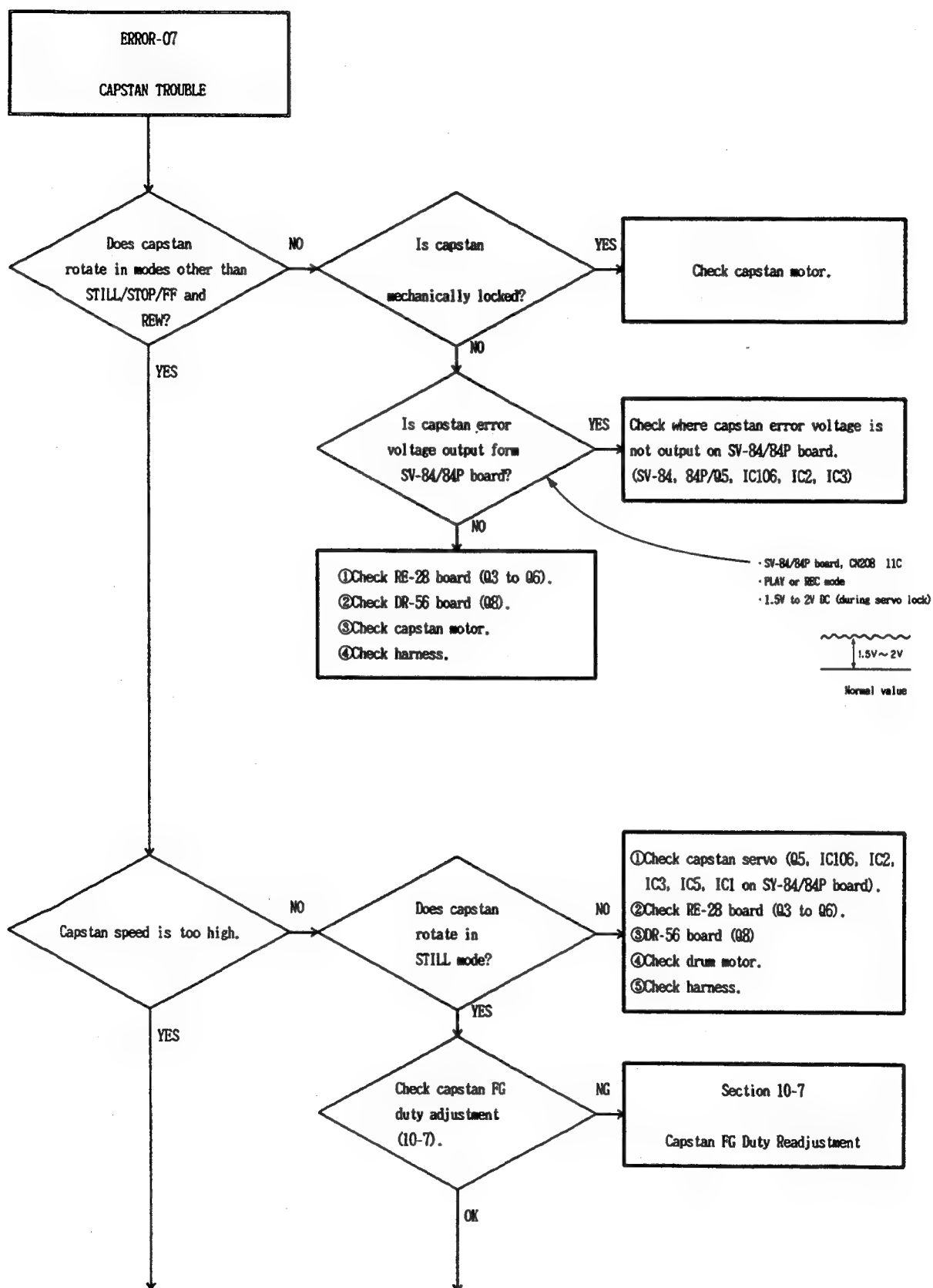


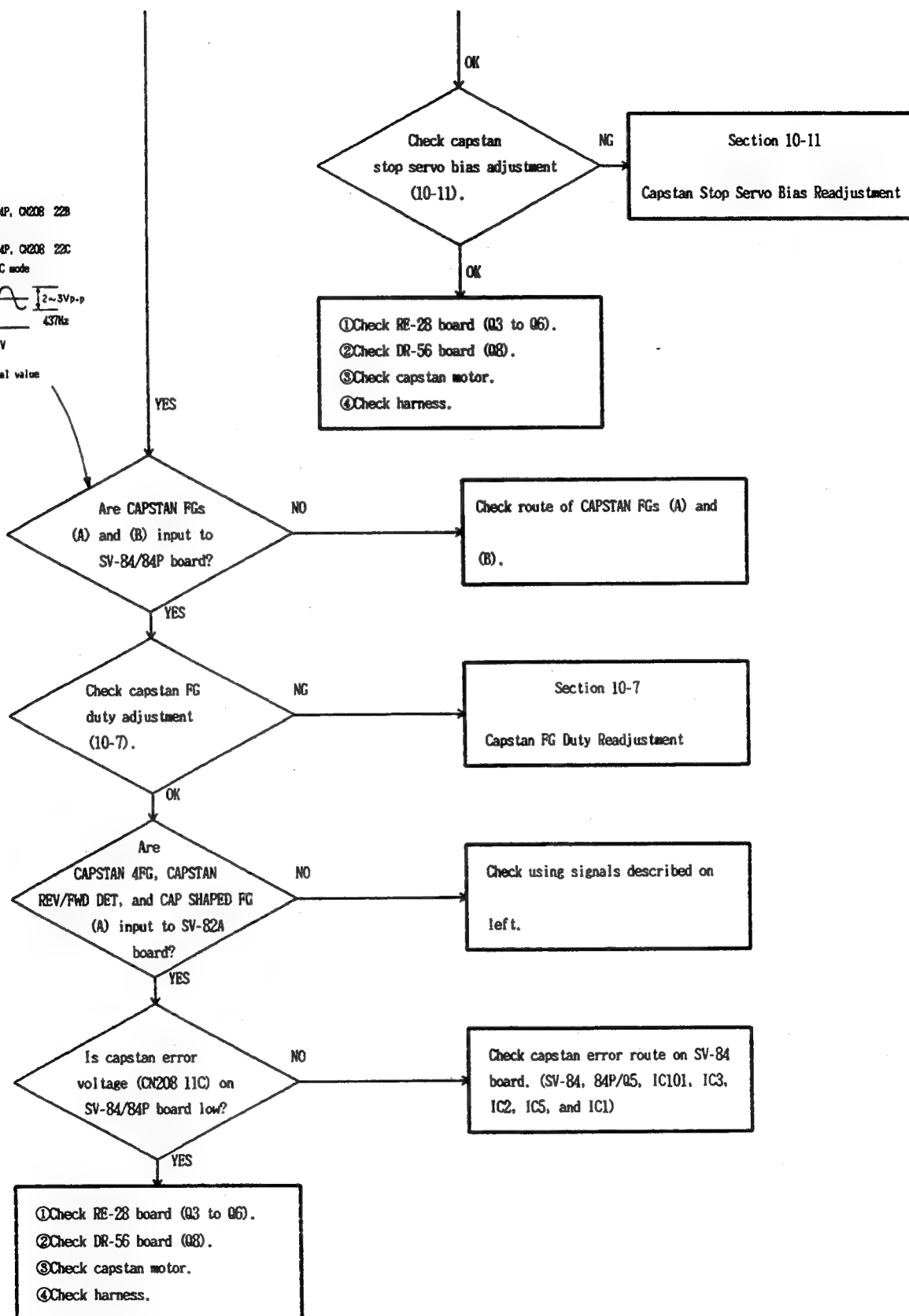
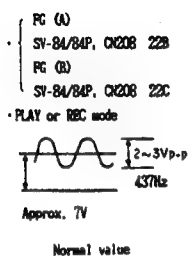
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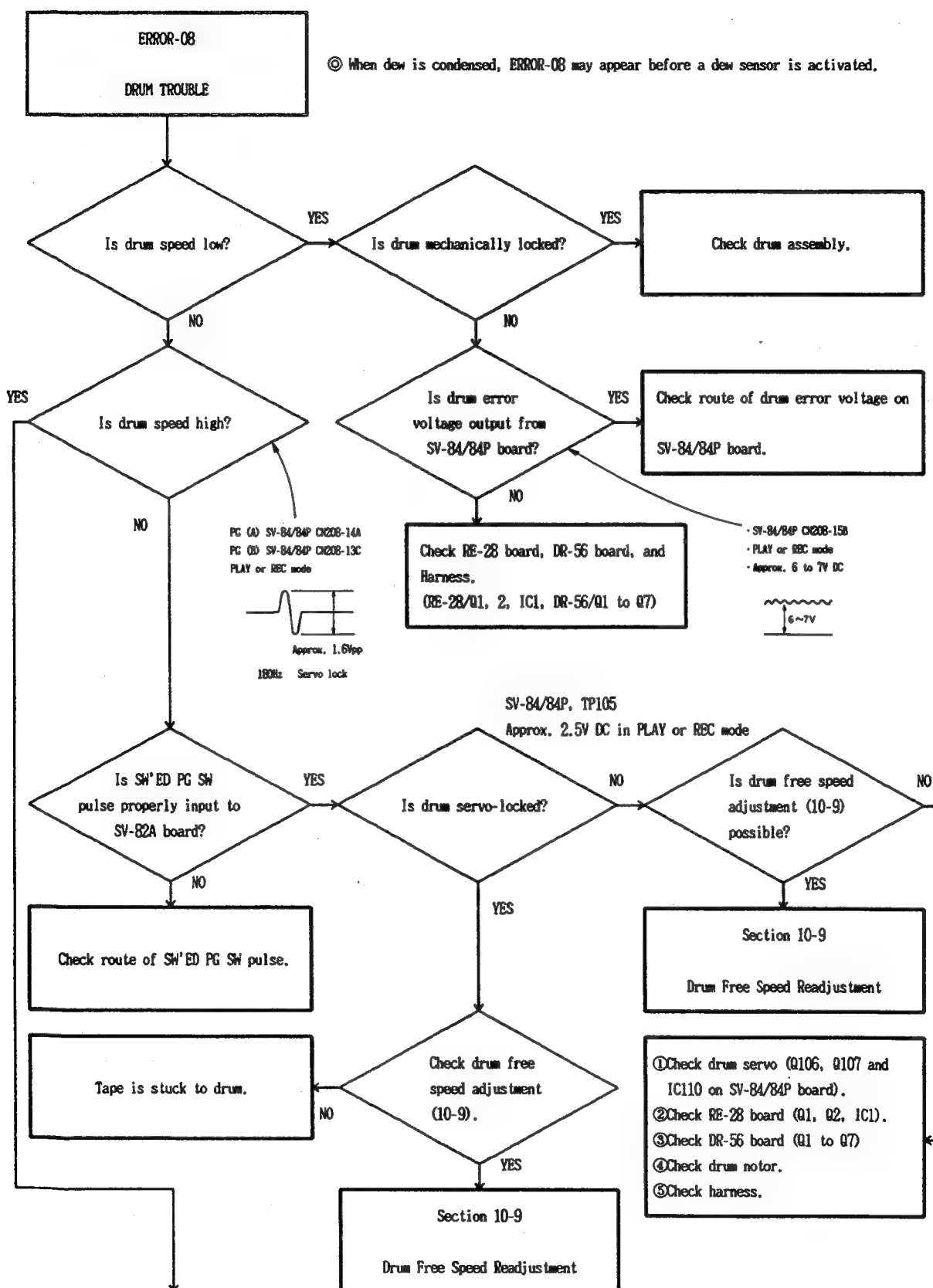




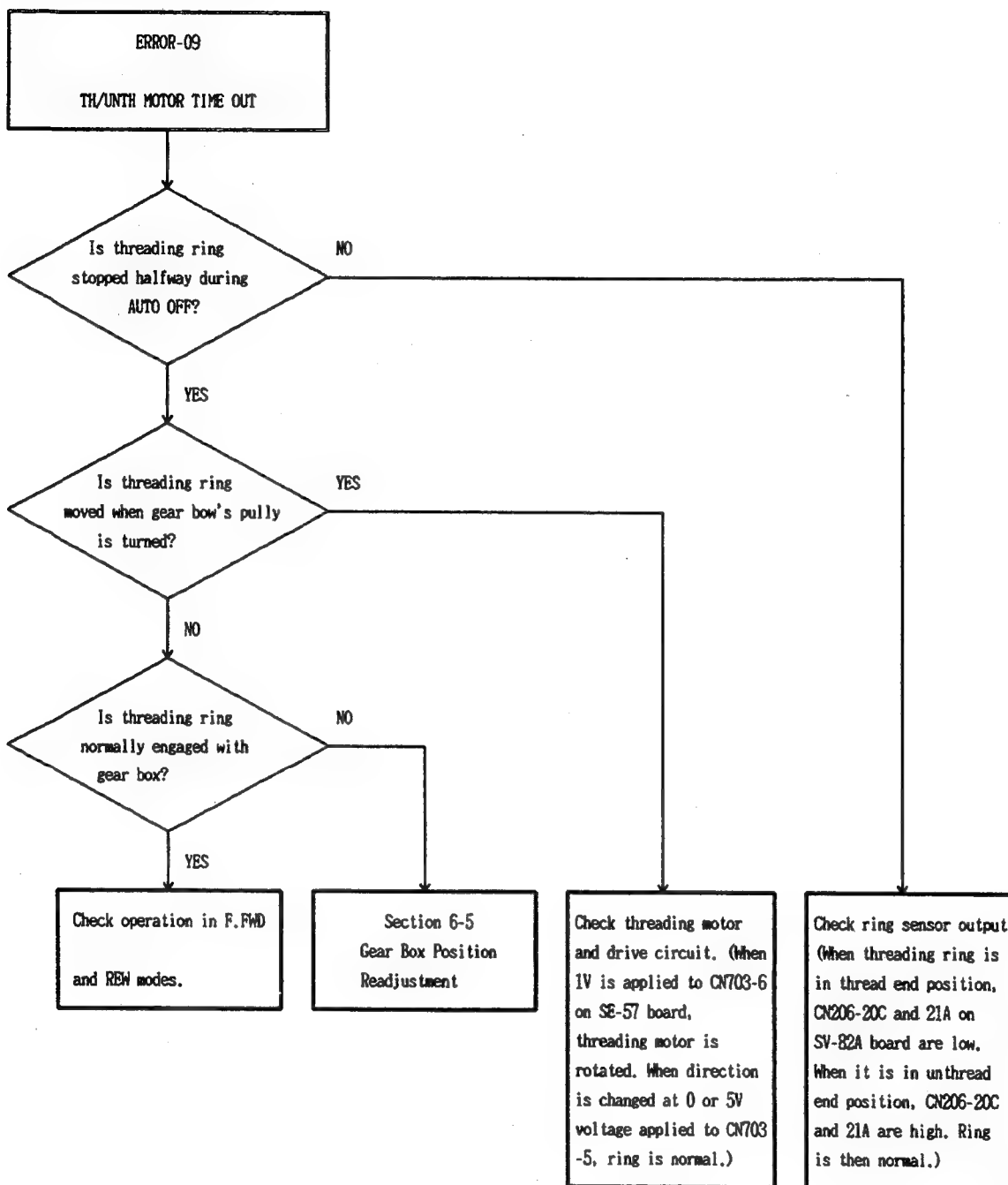


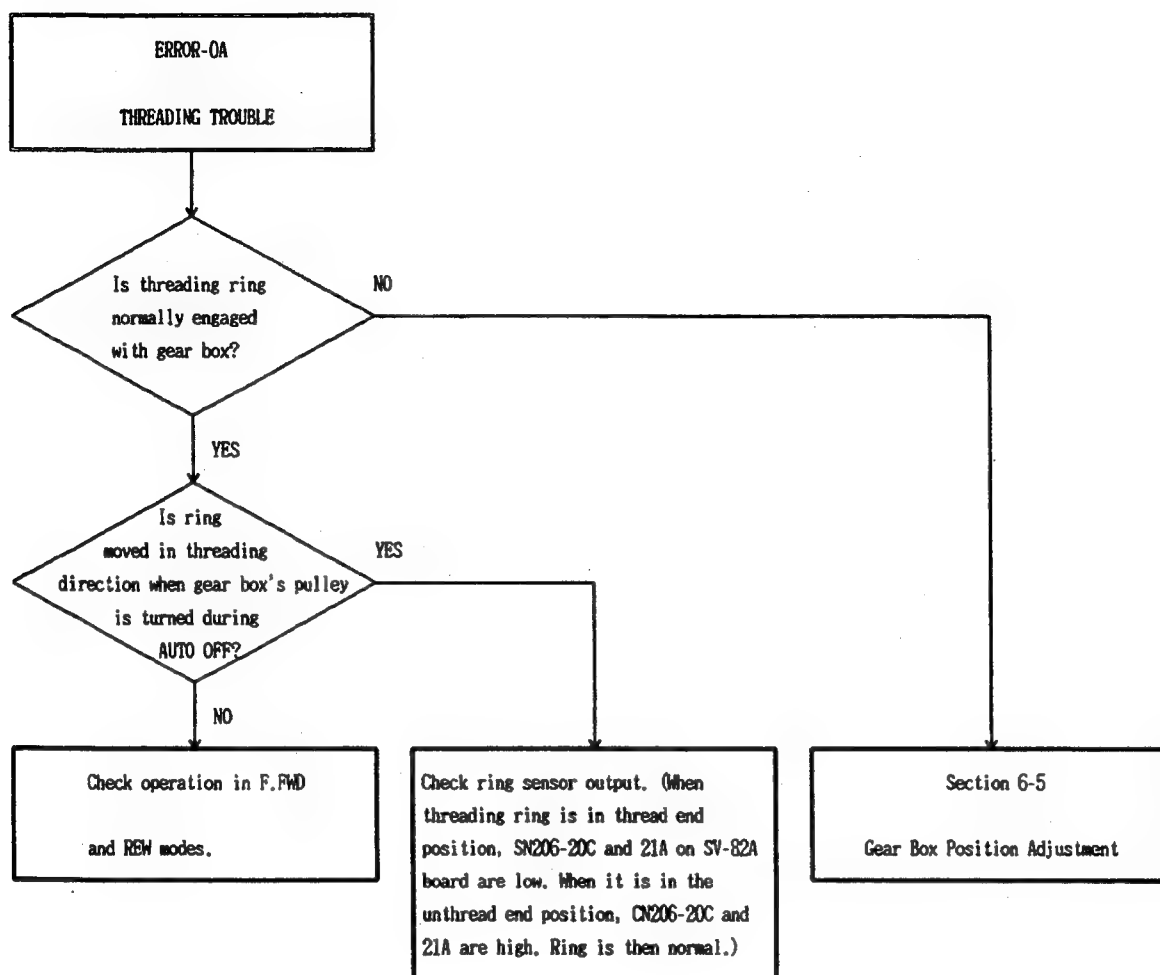


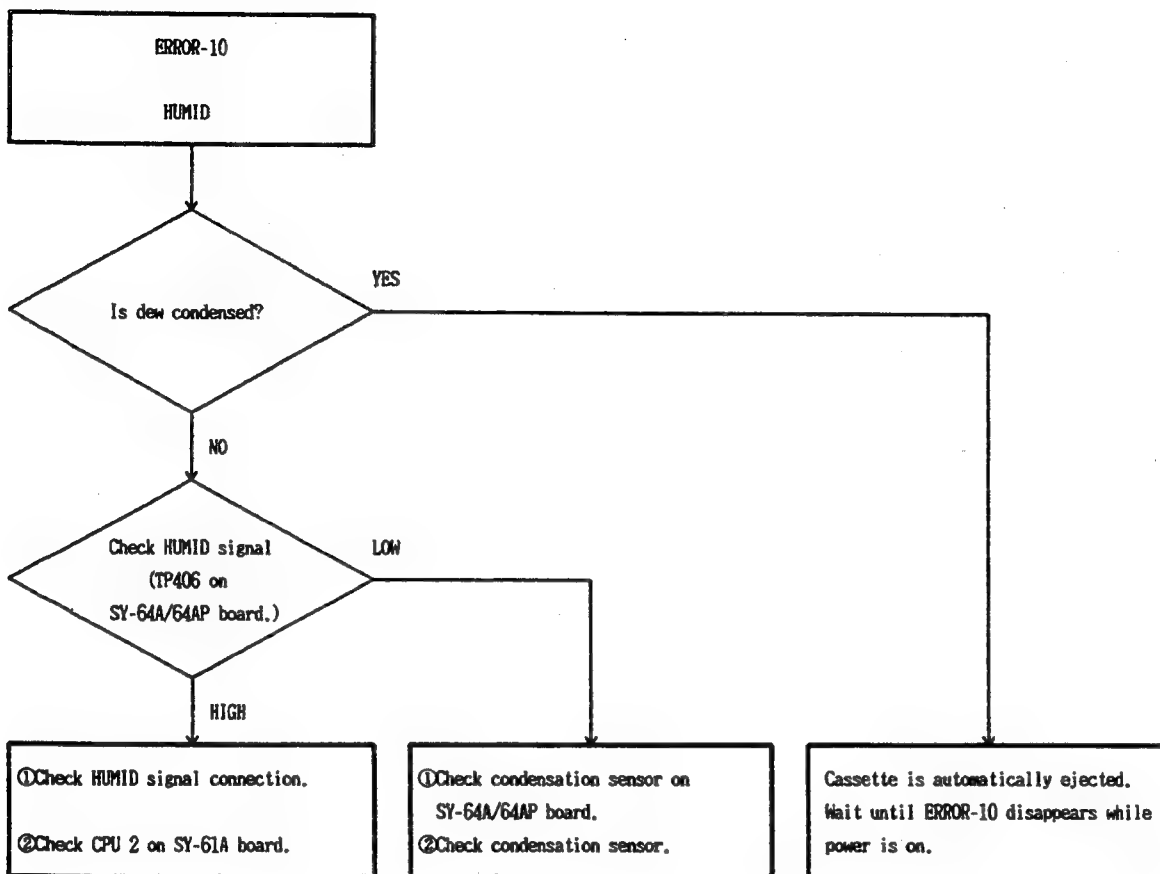




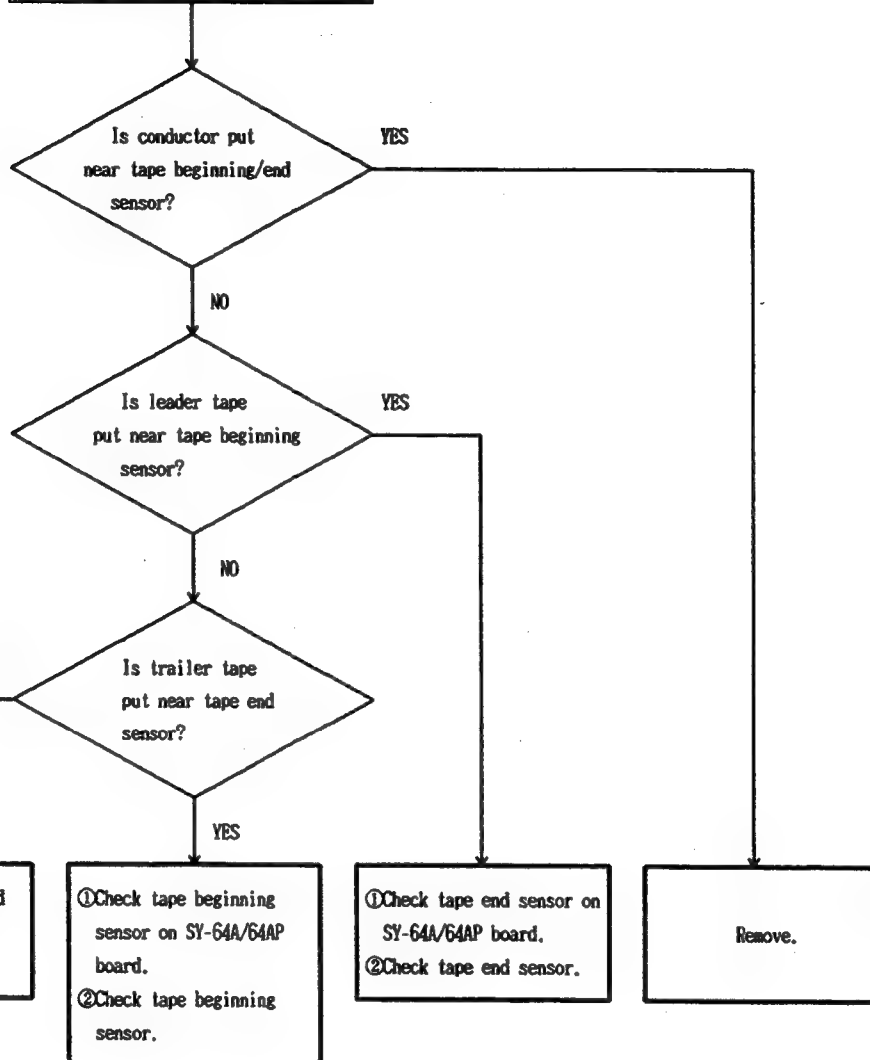


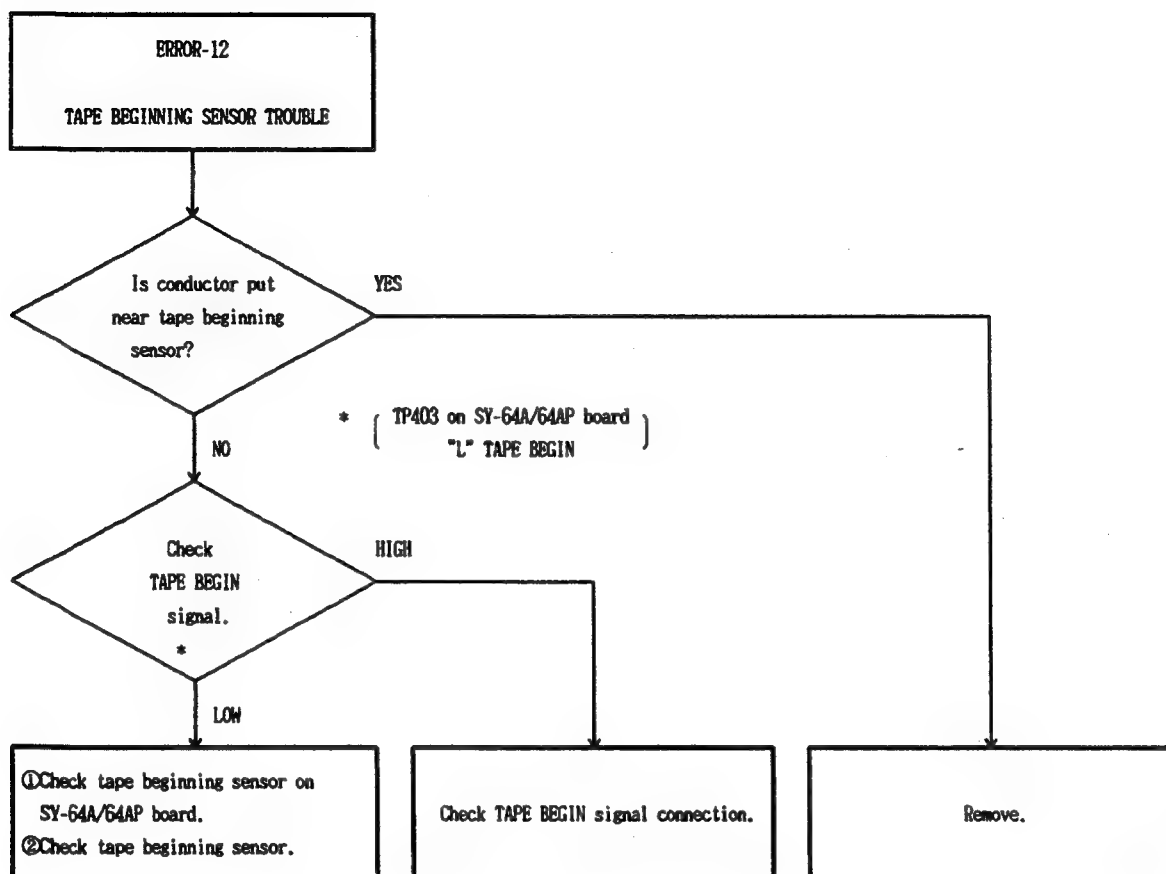


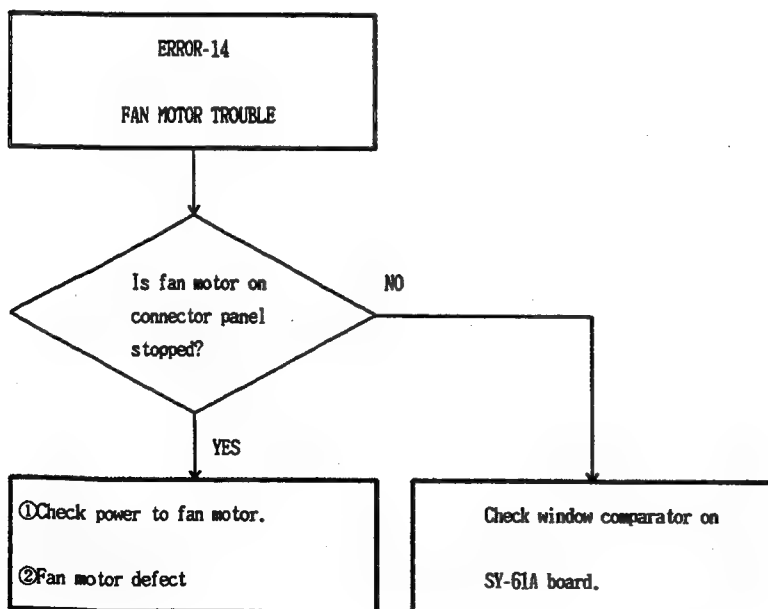
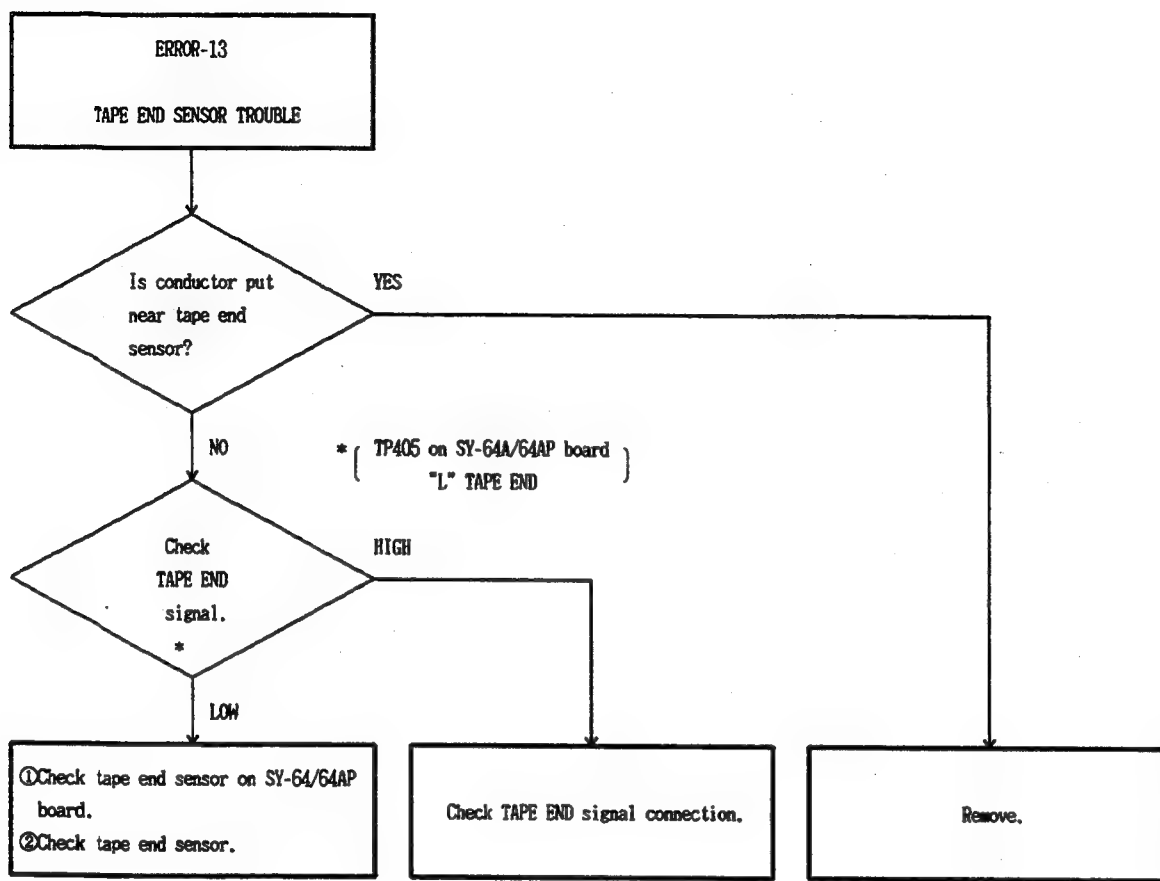




ERROR-11  
TAPE BEGINNING/END SENSOR TROUBLE









# **ERROR-20** **CASSETTE COMPARTMENT MOTOR LOCK**

NO  
Is cassette compartment activated?

YES

\* Is drive voltage supplied to motor?

YES

NO

Is CASSETTE COMPARTMENT EXIST signal low (CN331-3 on CL-14 board)?

NO

YES

Is CASSETTE DOWN 1 or 2 switch normal?

NO

YES

Check motor drive circuit (IC31 and peripherals on SY-64A/64AP board).

Check cassette down 1 or 2 sensor.

Check "L" CASSETTE COMPARTMENT EXIST signal.

Mechanism check  
① Motor joint runs idle.  
② Guide roller is worn or rotated heavily.  
③ Motor defect

## **\* Motor drive voltage (10 to 14V)**

The motor drive voltage is supplied for four seconds during cassette up/down operation. When the cassette compartment moving is not completed within four seconds, the voltage supply is stopped. When check cannot be made within this time, enter the CASSETTE UP/DOWN mode again after the SYSTEM RESET switch on the SY-61A board is pressed or power or is turned on again.

SY-64A/64AP board

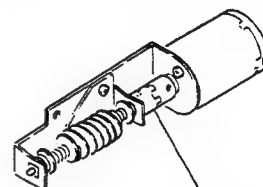
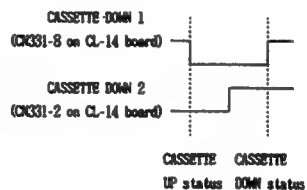
CASSETTE DOWN at TP2 or

CASSETTE UP at TP3

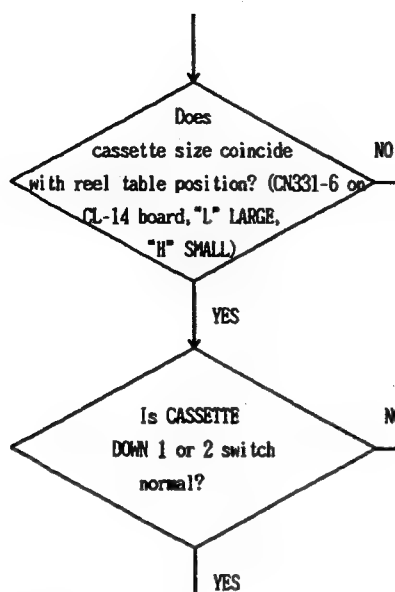
CL-14 board

CN331-10 CASSETTE DOWN

CN331-11 CASSETTE UP



\*Motor joint

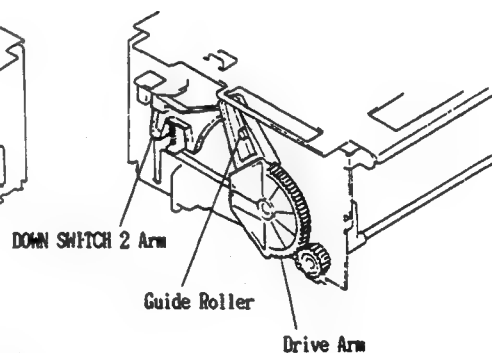
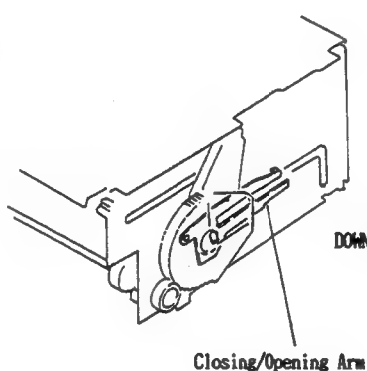
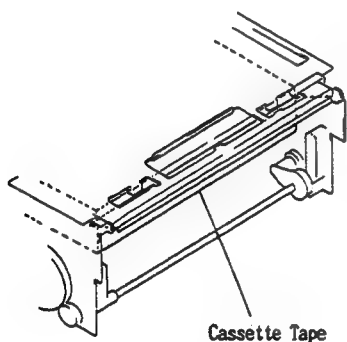


#### Mechanism check

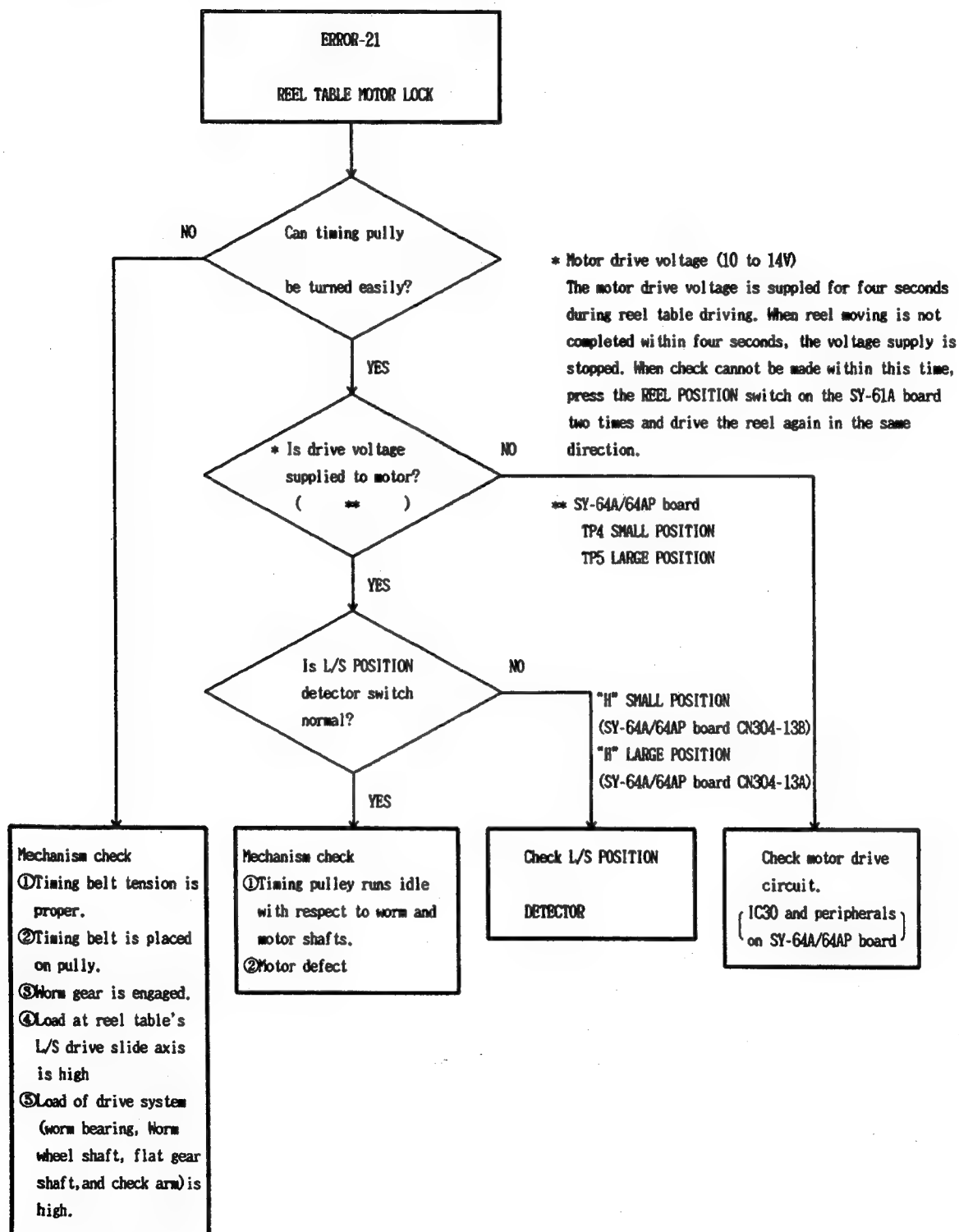
- ①Cassette tape is caught on door.
- ②Cassette compartment is caught on closing/opening arm.
- ③Guide roller is worn or rotated heavily.
- ④DOWN SWITCH 2 arm is engaged with drive arm.
- ⑤Motor defect

Check CASSETTE DOWN switches (1) and (2).

- ①Check CASSETTE L/S SIZE switch.
- ②Check that flat cable is broken.



- When this error occurs, remove and check the cassette compartment.
- When the cassette compartment is removed, the EJECT button is pressed, and the REEL POSITION switch on the SY-61A board is pressed in UNTHREAD END mode, the reel position can be selected at random.



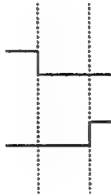
|||||

ERROR-22  
REEL TABLE SENSOR TROUBLE

Check reel table's  
L/S POSITION sensor.

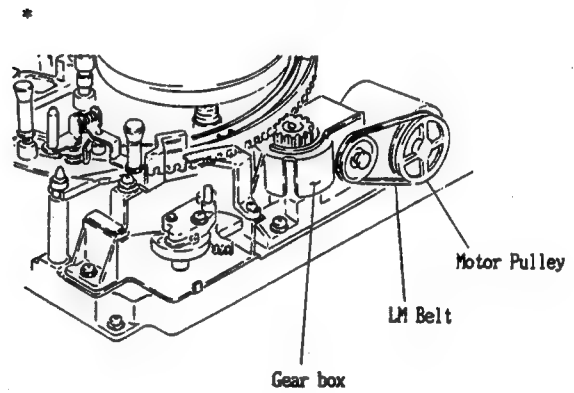
"H" SMALL POSITION  
(SY-64A/64AP board OK304-13B)

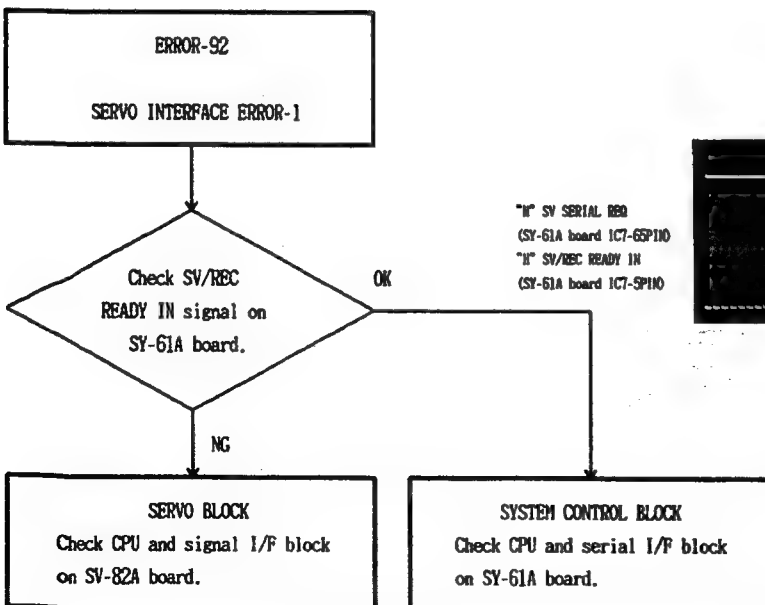
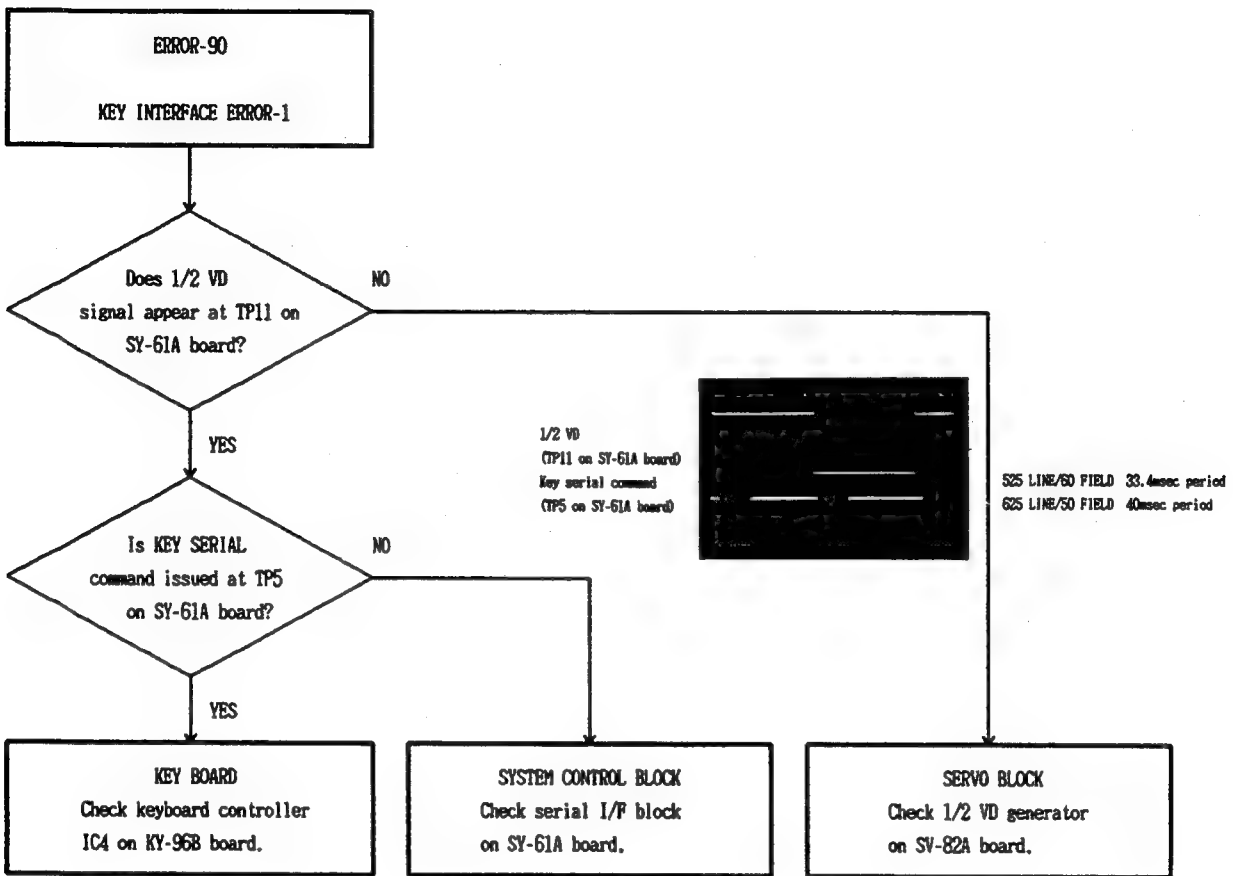
"H" LARGE POSITION  
(SY-64A/64AP board OK304-13A)



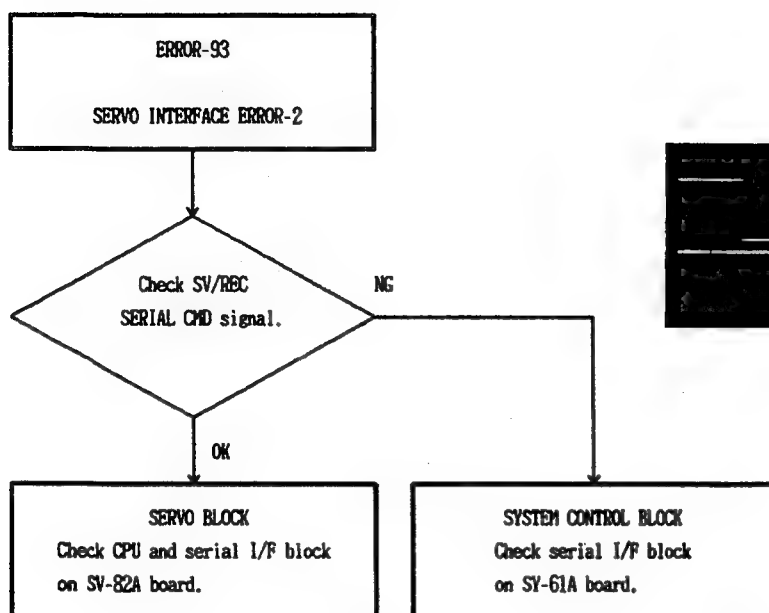
ERROR-23  
THREADING RING POSITION ERROR

Mechanism check  
① Gear box assembly's motor pulley is  
turned easily.  
② Gear box position adjustment (6-5)  
is normal.  
③ Slip occurs in LM belt.





|||||



ERROR-95  
SY CPU INTERFACE ERROR

Check CPU1, CPU2, 2K-byte I/F RAM,  
and peripherals on SY-61A board.

ERROR-96  
NV-RAM ERROR

Occurs  
when power is turned  
on directly after ROM on  
SY-61A board is  
replaced.

Check NV-RAM (IC4) or peripherals on  
SY-61A board.

When ROM is replaced, NV-RAM is  
automatically set again to factory  
setting according to ROM version and  
displayed by error message in  
parentheses. If no error message  
appears again during power on,  
operation is normal.





## SECTION 3

### PERIODIC CHECK AND MAINTENANCE

#### 3-1. SYSTEM CONTROL OPERATION CHECK

##### 3-1-1. Playback, F.FWD, REW, SHUTTLE, JOG, and Preroll Function Checks

The following should be checked daily before operation.

The check procedure described here is primarily for the BVW-65P but can also be applied to operating the remote control unit.

Note that the switches must be set according to how the machine is used after the checks.

- . Thread a recorded tape (Video, Audio CH-1/CH-2/CH-3/CH-4). (Do not use an alignment tape.)
- . Connect a video/audio monitor.
- . Internal switch setting: The following are the procedures when Item 101 is set to DATA No. 1 in the system setup. When it is set to DATA No. 0, the procedure indicated within the double line need not be performed.

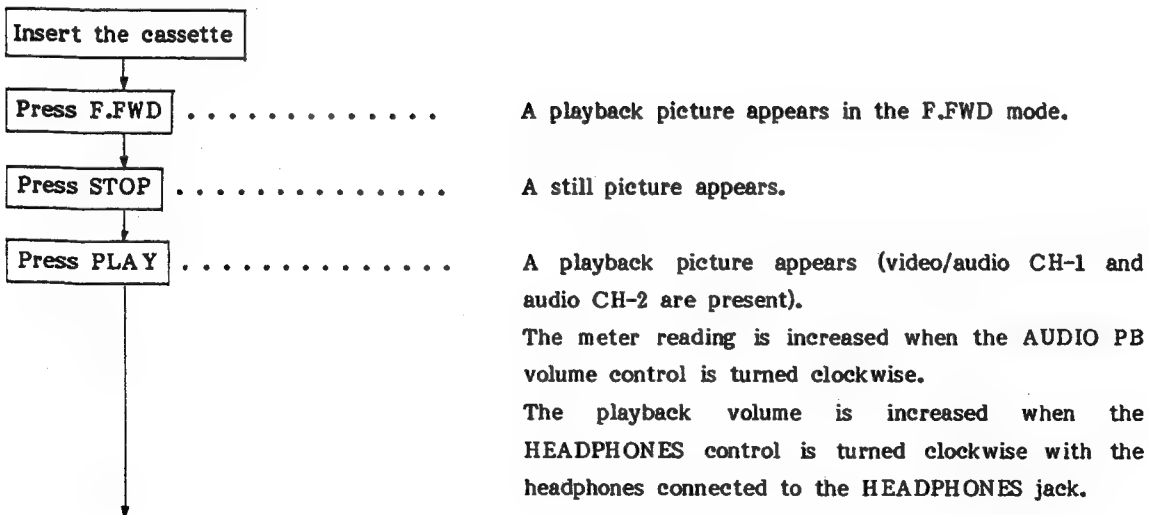
(Refer to Sec. 1-7 for further details.)

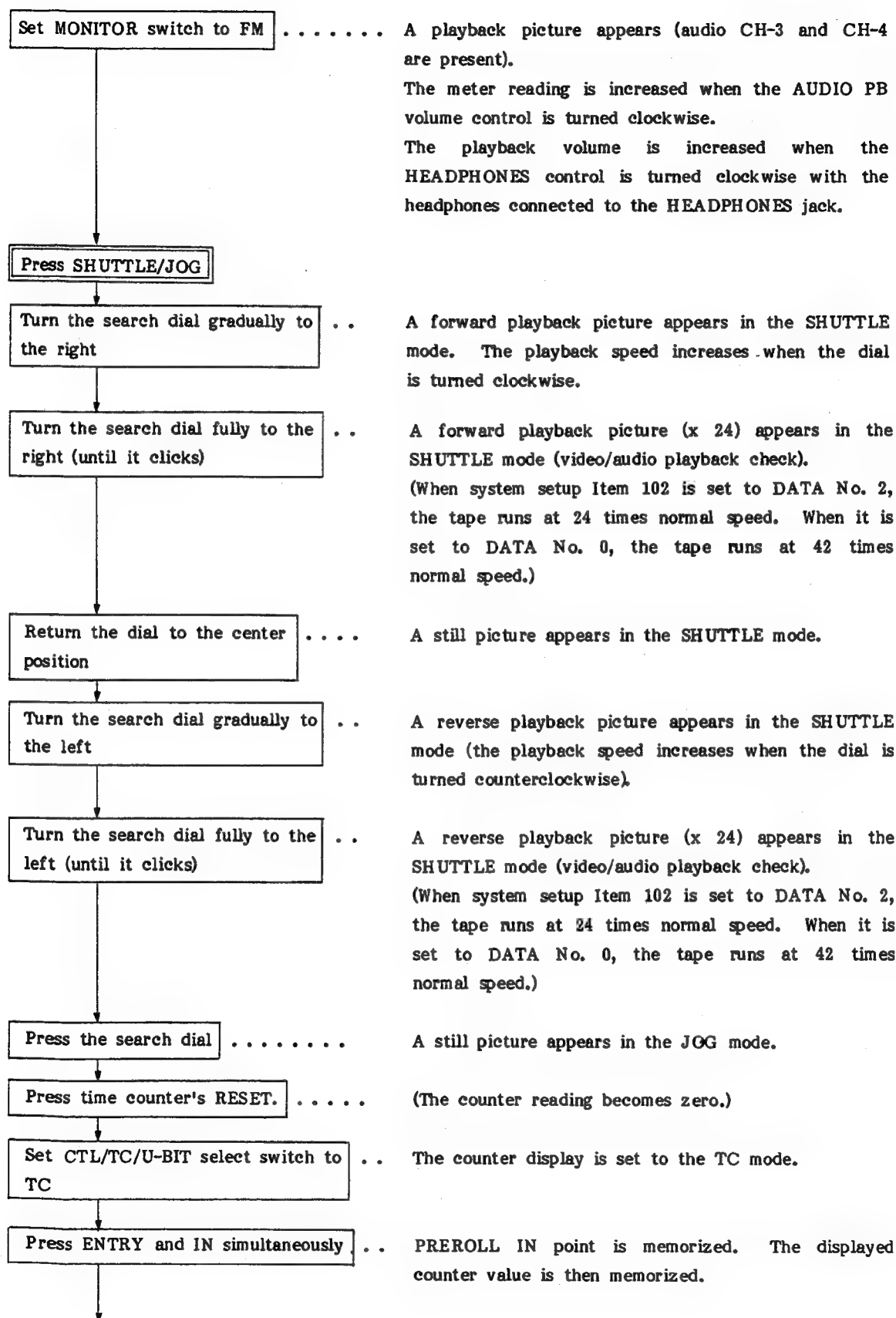
- . Select switch setting;
 

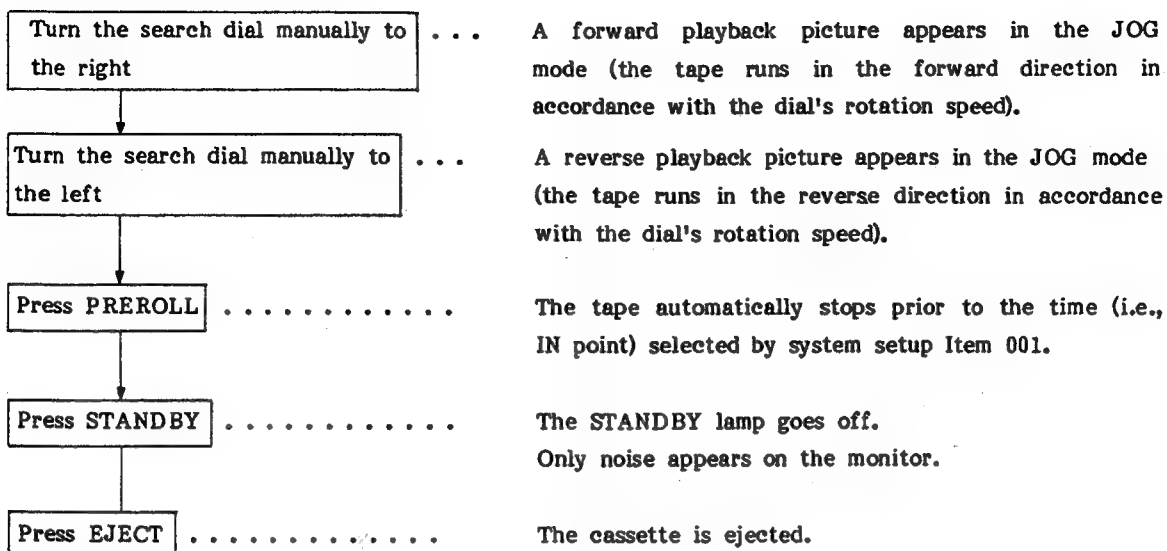
POWER	: ON
REMOTE/LOCAL	: LOCAL
AUDIO MONITOR	: ST/MIX
MONITOR	: LNG
CTL/TC/U-BIT	: CTL
DT SELECT	: SRC
SHUTTLE/JOG	: SHUTTLE

#### Action

#### Check that







### 3-1-2. DT Playback Function Check

The following should be checked daily before operation when the BVW-65P is used as a playback unit in the DT mode.

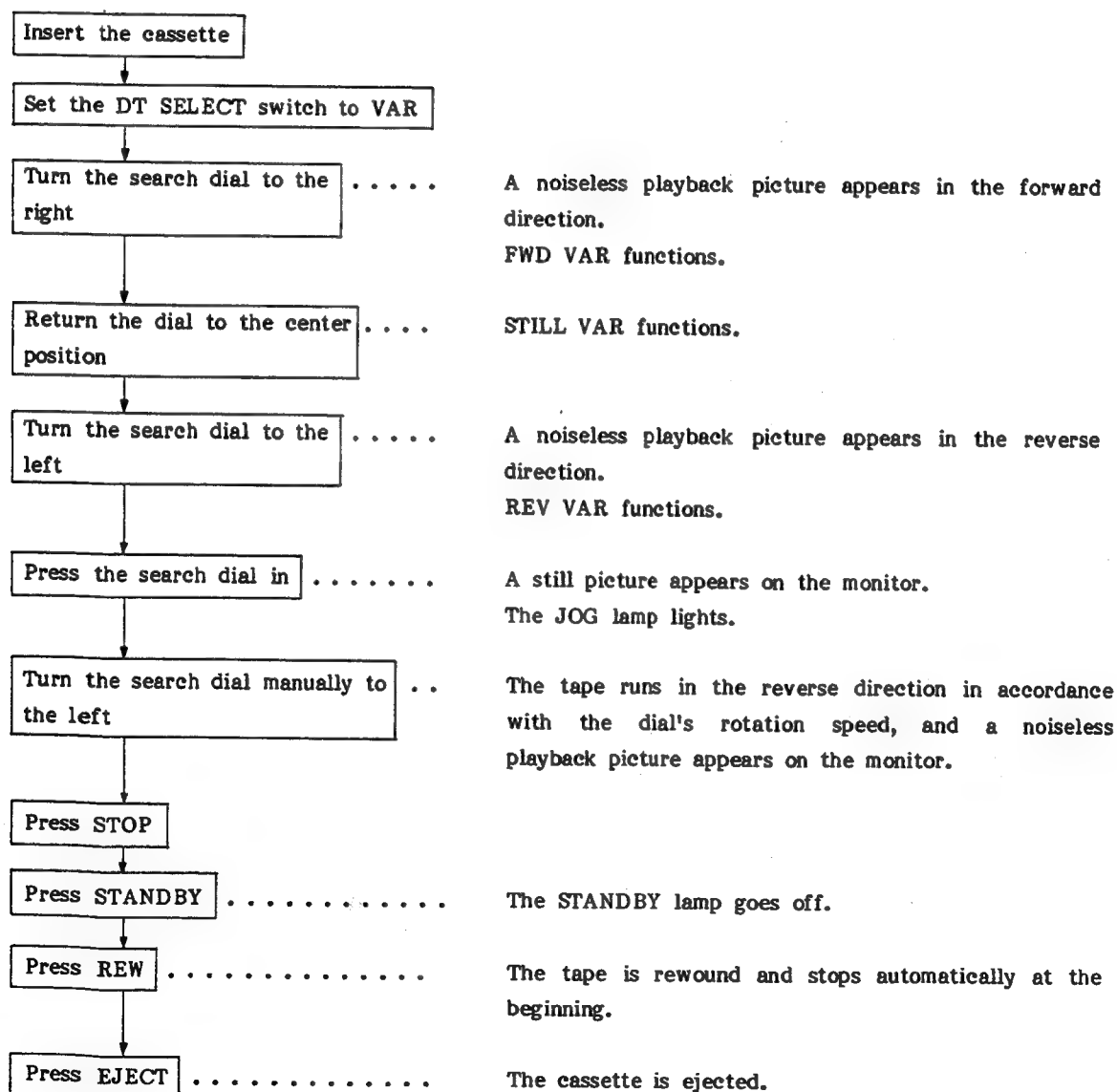
Note that the switches must be set according to how the machine is used after the checks.

- . Insert a video cassette tape on which a video signal is recorded. (Do not use an alignment tape.)
- . Connect a video monitor.
- . Select switch setting:
 

POWER	: ON
REMOTE/LOCAL	: LOCAL
DT SELECT	: VAR
SHUTTLE/JOE	: SHUTTLE

#### Action

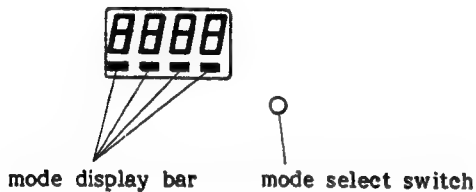
#### Check that



### 3-2. DIGITAL HOURS METER

#### 3-2-1. Outline

When you open the Function Control Panel, a digital hours meter can be seen on the left of the chassis. The hours meter has four display modes. The accumulated elapsed operation time or the number of operations is displayed for every mode. It is recommended to perform the periodic checks and maintenance based on the hours meter.



**Note:** The hours meter, which has a built-in battery, should be replaced every 5 years.

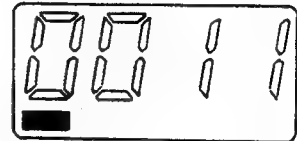
#### 3-2-2. Description of the Display Mode

1. T1: OPERATION METER mode
  - Displays accumulated time that the power of the unit has been turned on.
2. T2: DRUM RUNNING METER mode
  - Displays accumulated rotation time of the drum in the THREADING END mode.
3. T3: TAPE RUNNING METER mode
  - Displays accumulated tape running time in the F.FWD REW, PLAY, and SEARCH modes (not including the STILL mode).
4. CT: THREADING/UNTHREADING COUNTER mode
  - Displays accumulated number of threading and unthreading operations.

#### . T1, T2, and T3

These modes display the accumulated time. The actual operation time is equal to the displayed value multiplied by 10.

##### Example

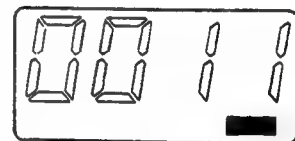


This display indicates between 110 hours 00 minutes 00 seconds and 119 hours 59 minutes 59 seconds (up to a maximum of 99,999 hours 59 minutes 59 seconds can be displayed).

#### . CT

This mode displays the number of operations instead of the hours. The actual operation number is equal to the displayed value multiplied by 10.

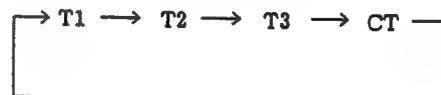
##### Example



This display indicates between 110 and 119 operations.

#### 3-2-3. Mode Selection

When the mode select switch is pressed, the display rotates in the sequence shown below.



When the mode is set, the mode display bar in the designated mode lights or blinks. The VTR operation status at that time is described below.

Mode	Lights	Blinks
T1	. VTR power is off.	. VTR power is on.
T2	. VTR power is off. . VTR power is on in a mode other than THREADING END.	. Drum is rotating in the THREADING END mode.
T3	. VTR power is off. . VTR power is on in a mode other than F.FWD, REW, PLAY, SEARCH, REC, or EDIT.	. Tape is running in the F.FWD, REW, PLAY, or Search mode.
CT	—	. Every time if VTR power is on or off.

### 3-3. MAINTENANCE AFTER REPAIRS

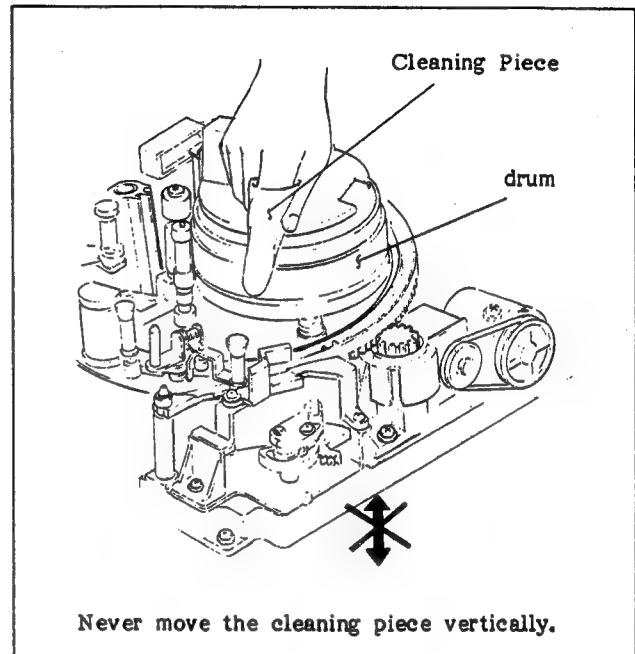
Perform the following maintenance after repairs regardless of the unit operating hours:

1. Video heads and stationary heads cleaning.  
(Refer to Sections 3-3-1 and 3-3-2.)
2. Tape movement area cleaning.  
(Refer to Section 3-3-3.)

**NOTE:** Wait until the cleaning fluid evaporates completely before inserting a cassette tape.

#### 3-3-1. Cleaning Procedure of the Video Head

Press a cleaning piece moistened with cleaning fluid and turn the drum slowly with hand.



**NOTE:** Never move the cleaning piece in the vertical direction of the head tip.

- . Clean the head with the power off.

Never move the cleaning piece vertically.

#### 3-3-2. Cleaning Procedure of the Stationary Heads

Clean with a cleaning cloth moistened with cleaning fluid.

#### 3-3-3. Cleaning Procedure of the Tape Movement Areas

Wipe the tape bearing surfaces (of the tape guides, drum, capstan and pinch roller) with a cleaning piece moistened with cleaning fluid.

**NOTE:** Do not clean the surface of the condensation sensor on the lower drum with the moistened cleaning piece; clean it with a dry cloth.

### 3-4. PERIODIC CHECK

To obtain the higher function and performance of the unit or the longer lives of the unit and tape, perform the periodic checks below according to the hours meter reading on the front panel.

Item	Part No.	Hours meter mode	Replacement	Remarks
Upper drum replacement	A-6762-349-A	T2	1,000 H	The video head life is greatly affected by operational conditions and tapes. Clean every 500 hours.
Cleaning roller replacement	X-3675-858-1	T2	1,000 H	
Brush replacement	A-6050-646-A	T2	3,000 H	
Slip ring replacement	A-6050-546-A	T2	3,000 H	Clean every 1,000 hours with a designated jig.
Pinch roller replacement	X-3717-215-2	T3	1,000 H	Clean every 500 hours.
Lower drum replacement	A-6050-552-A	T2	3,000 H	Clean the drum's tape transport surface every 500 hours.
TG1 tape guide replacement	A-6746-027-C	T3	3,000 H	
TG2 tape guide replacement	A-6746-028-C	T3	3,000 H	
TG3 tape guide replacement	A-6746-029-C	T3	3,000 H	
TG4 tape guide replacement	A-6746-030-C	T3	3,000 H	
Replacement of tape guide's upper and lower flanges on threading ring	3-717-267-01 3-680-812-00	T3	3,000 H	
Reel motor replacement	A-6737-175-A	T3	3,000 H	
Capstan motor replacement	8-835-259-02	T3	3,000 H	
Audio confi head replacement	8-825-771-11	T3	3,000 H	Clean every 500 hours.
CTL head replacement	8-825-554-73	T3	3,000 H	Clean every 500 hours.

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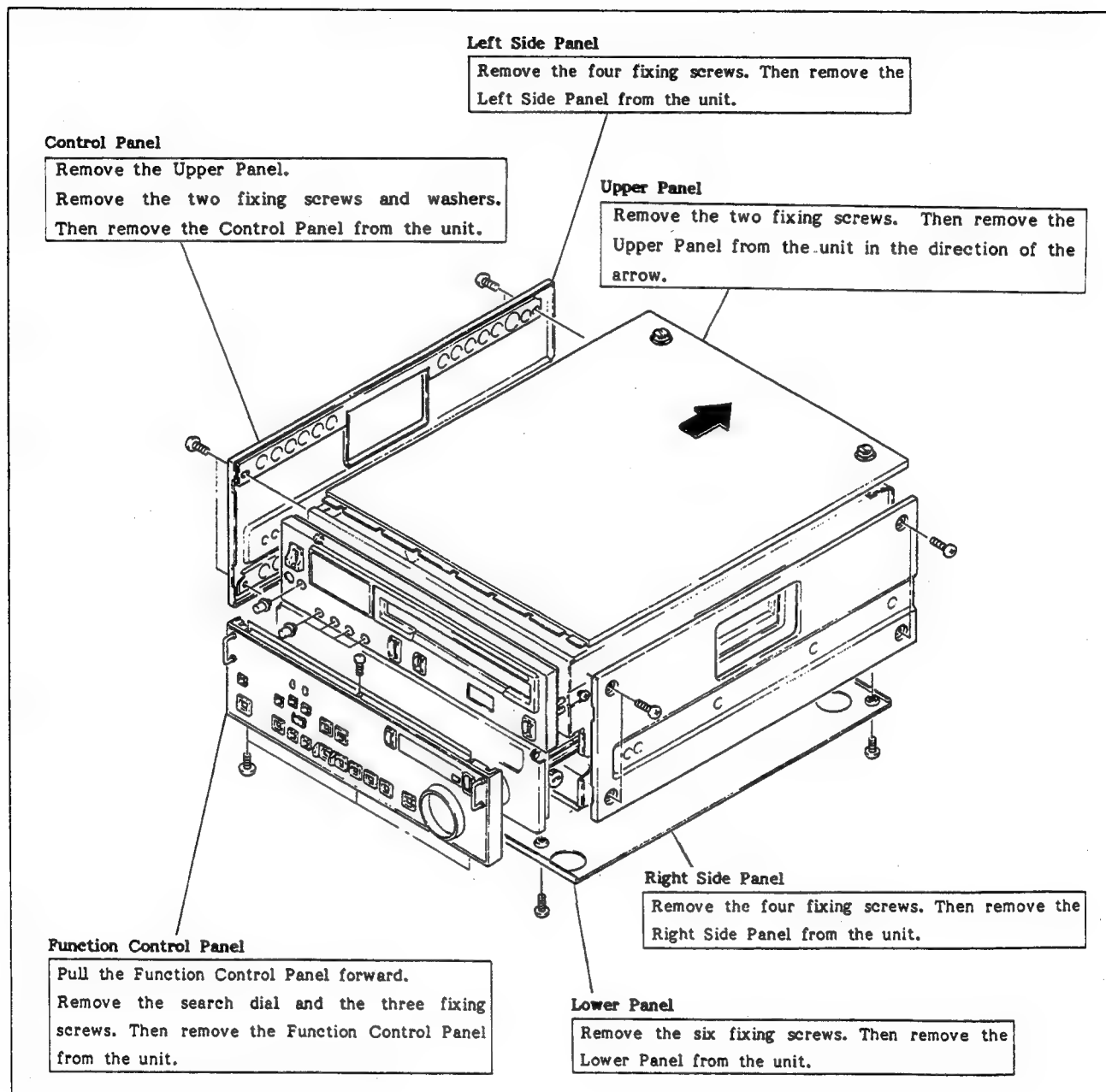
Item	Part No.	Hours meter mode	Replacement	Remarks
Threading belt (LM belt) replacement	3-688-066-01	CT T2	100,000 times 4,000 H	Replace either of them.
Gear box replacement	A-6750-213-E	CT	200,000 times	Do not replace the threading motor only, but whole gear box.
T gear 1 assembly replacement	X-3717-250-1	CT	100,000 times	
Fan motor replacement	1-541-524-11	T1	10,000 H	
S/T brake solenoid replacement	1-454-417-41	CT	200,000 times	
Pinch solenoid replacement	1-454-338-00	CT	200,000 times	Used in LMS system.
	1-454-338-00	T3	3,000 H	Used in systems other than LMS.
Cassette-up compartment replacement	A-6751-360-D	CT	100,000 times	Do not replace the cassette-up compartment motor only, but whole cassette-up compartment.
Main brake replacement	A-6741-066-A	CT	200,000 times	
Ring roller replacement	3-675-866-00	CT	200,000 times	After ring roller replacement, perform the tape run adjustment and the tracking adjustment. Replacement during overhauling is recommended.
Hours meter replacement	1-548-152-11	Replace every five years.		The digital hours meter has an internal battery.



## SECTION 4

### SERVICE INFORMATION

#### 4-1. REMOVAL OF CABINET

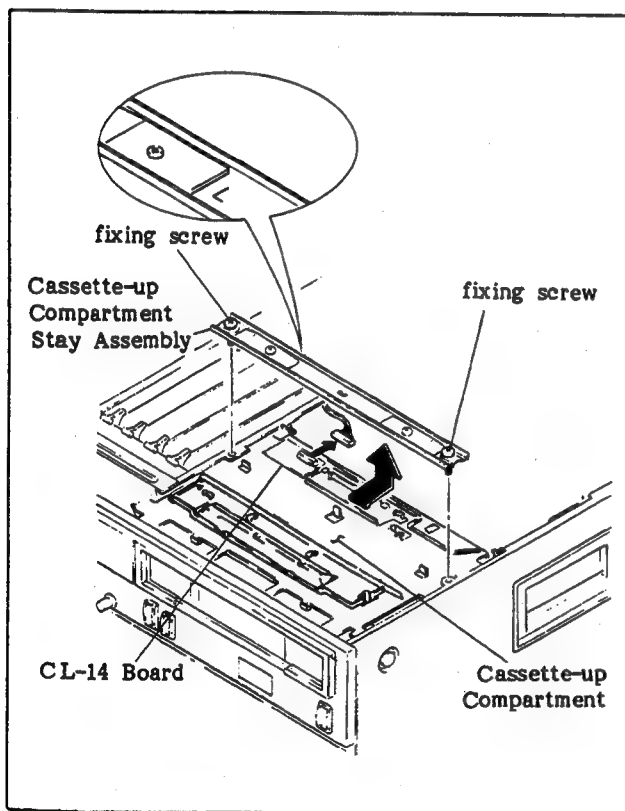


#### 4-2. REMOVAL/INSTALLATION OF CASSETTE-UP COMPARTMENT

1. Remove the Upper Panel. (Refer to Section 4-1.)
- . Removal**
2. Loosen the two fixing screws and remove the Cassette-up Compartment Stay. (This screw has a retainer.)
3. Disconnect connector CN331 on the CL-14 Board.
4. Move the Cassette-up Compartment in the direction as shown in the figure. Lift the Cassette-up Compartment Block slowly.

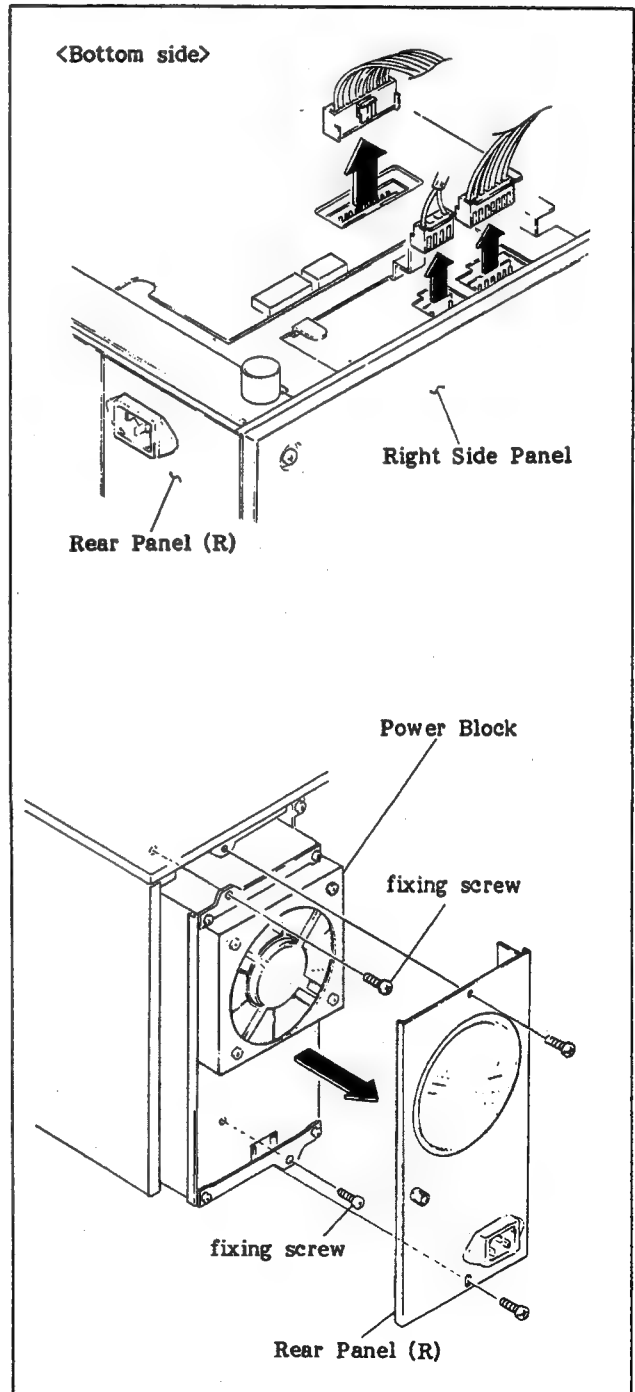
#### **. Installation**

5. Install the Cassette-up Compartment.
6. Make sure that the marked "L" on the Cassette-up Compartment Stay is on the left side; tighten the screw. And then tighten the screw on the right side.



#### 4-3. REMOVAL OF THE POWER BLOCK

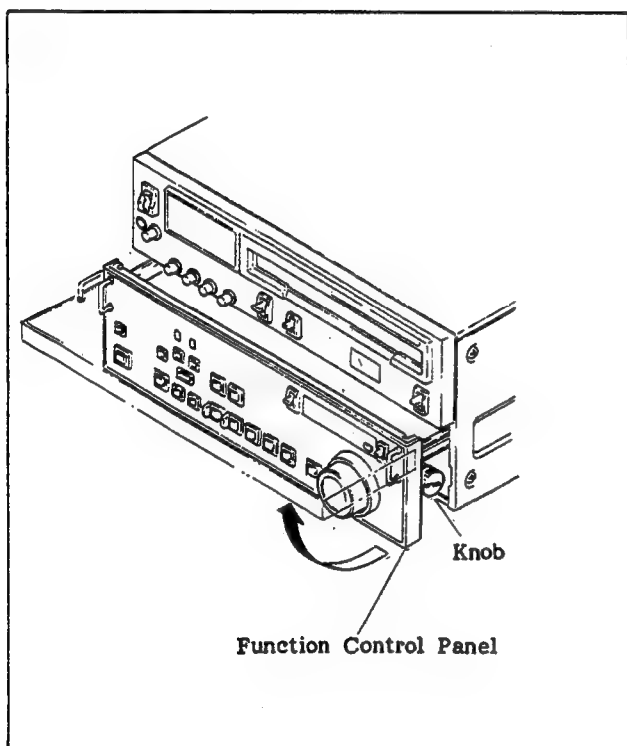
1. Remove the Lower Panel.
2. Remove the Shield Plate of the MB-191B Board.
3. Disconnect the connectors as shown in the figure.
4. Remove the Rear Panel (R).
5. Remove the two fixing screws as shown in the figure and remove the Power Block.



#### 4-4. HOW TO PULL IN/OUT THE FUNCTION CONTROL PANEL

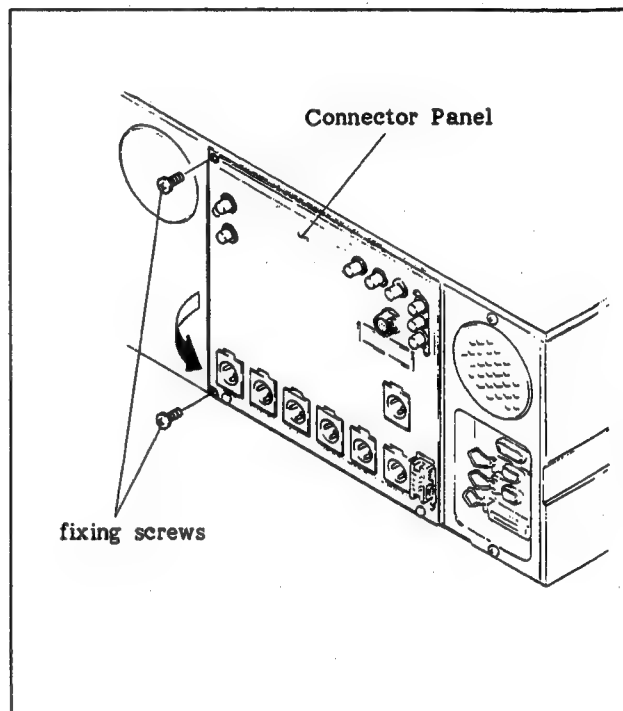
1. Pull the Function Control Panel on both right and left sides forward. Move the panel forward.
2. Pull it more forward to fix the panel. Lift the Function Control Panel. The panel moves maximum 90 degrees (the fixed position is selectable by five steps).
3. When putting the panel back in the unit, replace the panel and it into the unit.

**NOTE:** After using the panel, be sure to put it back into the unit.



#### 4-5. HOW TO OPEN THE CONNECTOR PANEL

Remove the two fixing screws shown in the figure, then open the Connector Panel in the direction of the arrow.



#### 4-6. NOTE FOR CHECK AND MAINTENANCE OF PRINTED CIRCUIT BOARD

Be sure to turn the power off before inserting or removing printed circuit boards.

#### 4-7. EXTENSION BOARD

The three extension board types are supplied in the BVW-65P. The Amp chassis printed circuit boards can be serviced using the extension board. Simply insert the extension board into the Amp chassis and connect the circuit board to be serviced to the end of the extension board.

Extension board	Connectable Printed Circuit Board
EX-116	SY-61A, SY-64AP
EX-134	AFM-1A, AU-118P, DT-13, DT-14P, EN-48P, SV-82A, SV-83B, SV-84P, TBC-9P, TC-40AP, VO-18AP
EX-151	DM-56P, TBC-7P/7D/7E, TBC-8P/12P

**NOTE:** In the EX-134 Board, the lever for removing board is installed only on one side.

#### 4-8. SPARE PARTS

(1)

The shaded and  $\Delta$ -marked components are critical to safety.  
Replace only with the same components as specified.

(2)

Replacement parts supplied from the Sony Parts Center will sometimes have a different shape and outside view from the parts which are used in the unit. This is due to "accommodating improved parts and/or engineering changed" or "standardization of genuine parts".

- This manual's exploded views and electrical spare parts lists indicate the part numbers of "the present standardized genuine parts".
- Regarding engineering part changes by our engineering department, refer to Sony service bulletins and service manual supplements.

(3)

The parts marked with "s" in the SP column of the exploded views and electrical spare parts lists are normally stocked for replacement purposes. The parts marked with "o" in the SP column are not normally required for routine service work. Orders for parts marked with "o" will be processed, but allow for additional delivery time.

#### **4-9. HOW TO OPERATE THE UNIT WITHOUT INSTALLING CASSETTE TAPE**

The following procedures are described without installing the Cassette-up Compartment.

##### **1. Threading**

- . Turn the power on. The threading ring rotates in a counterclockwise direction automatically, and the unit is put into the threading completion mode.

##### **2. PLAY**

- . Set DIP switch S106 on the SY-61A board to ON and set System Setup Item 902 to 1. When the PLAY button is pressed, the unit enters the PLAY mode. After adjustment is completed, set the DIP switch and setup menu to the former mode.

##### **3. Unthreading**

- . Press the EJECT button after the unit is put into the threading completion mode. The threading ring rotates in a clockwise direction.

##### **4. Search**

- . Turn the SEARCH dial after the unit is put into the threading completion mode.

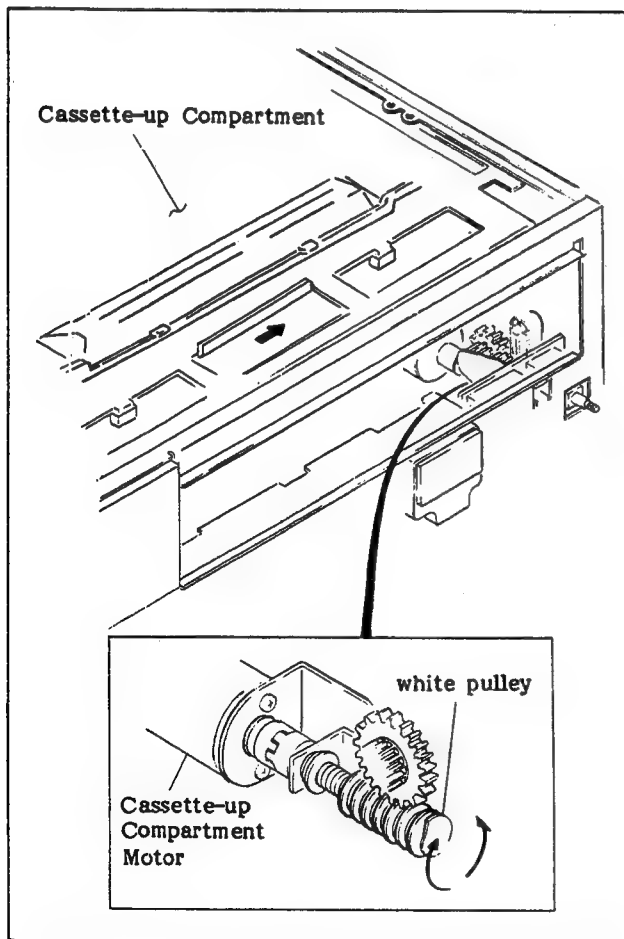
##### **5. F.FWD and REW**

- . Select the DIP switch and setup menu as in Step 2. When the F.FWD or REW button is pressed, the unit enters the F.FWD or REW mode. After adjustment is completed, set the DIP switch and setup menu to the former mode.

#### 4-10. HOW TO REMOVE A CASSETTE WHEN THE TAPE IS SLACKENED IN THE UNIT

When the tape in the unit is slack, remove the cassette tape by the following procedures:

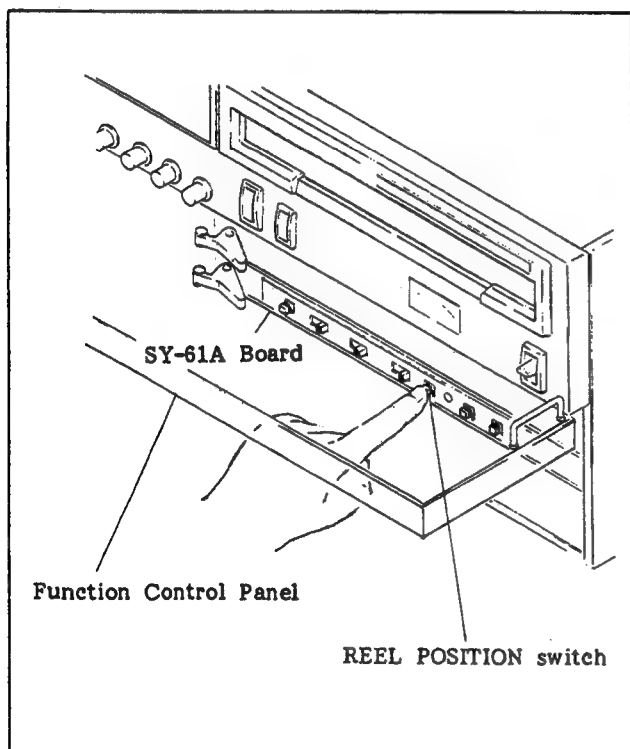
1. Turn the power off.
2. Turn the pulley of the Gear Box Block until the Pinch Roller enters the EJECT completion mode.
3. Remove the Cassette-up Compartment Stay.
4. Disconnect connector CN331 on the CL-14 Board of the Cassette-up Compartment.
5. Pull out the function control Panel, raise it 90 degrees, and fix it.
6. Turn the white pulley as shown in the figure by hand while holding the cassette lid by hand to prevent it closing so that the Cassette-up Compartment moves up.



7. Stop rotating the white pulley just before the Cassette-up Compartment moves to the surface.
8. Lift the Cassette-up Compartment slowly from the unit while holding the cassette lid.
9. Close the cassette lid carefully so that it is not damaged.
10. Remove the cassette from the Cassette-up Compartment.
11. Release the lock of the cassette lid, wind the tape into the cassette by turning the reel hub on the back of the cassette by hand.
12. Turn the pulley as Step 7 so that the stage of the Cassette-up Compartment moves the cassette out position.
13. Install the Cassette-up Compartment into the unit.
14. Connect the connector, then install the Cassette-up Compartment Stay.
15. Clean the Motor Belt of the Gear Box Block with a cloth moistened with cleaning fluid.
16. Locate the cause of the trouble and remedy the problem.

#### 4-11. HOW TO CHECK THE REEL TABLE OPERATION

- . When power is turned on, you can check whether the Reel Table moves to the specified position without inserting the cassette tape.
  - . If the Cassette-up Compartment is not installed when the mechanism is adjusted, the Reel Table can be moved to the position corresponding to an L or S cassette according to the procedures below.
1. Disconnect connector CN331 on the CL-14 Board of the Cassette-up Compartment.
  2. Turn the power on.
  3. Press the EJECT button on the Function Control Panel.
  4. Open the Function Control Panel and press the REEL POSITION select switch on the SY-61A Board.



5. The Reel Table moves.

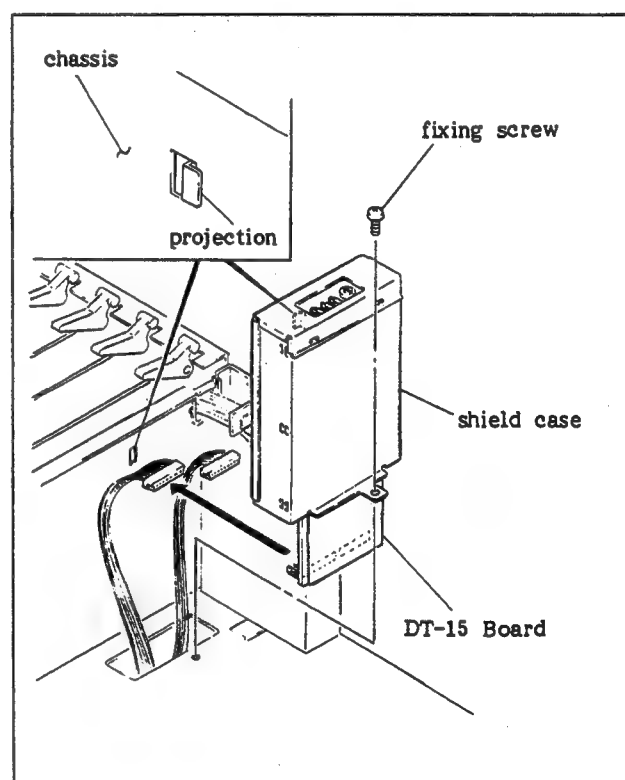
The set enters S mode from L mode or enters L mode from S mode. When the REEL POSITION select switch is pressed again, the set returns to the original mode.

#### 4-12. SERVICE OF THE CIRCUIT BOARD

The method of servicing circuit boards (except plug-in boards) is described below.

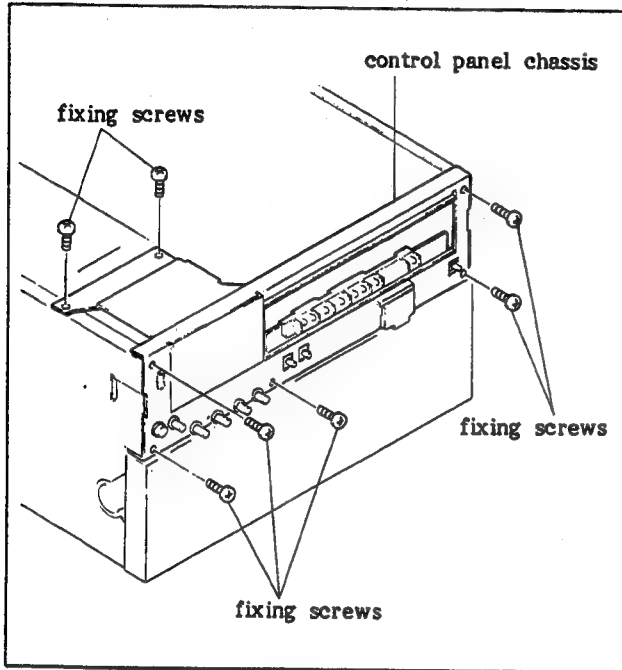
##### DT-15 Board

1. Remove the Upper Panel.
2. Remove a fixing screw of the shield case.
3. Disconnect the harness connectors.
4. Remove the DT-15 Board from the unit.
5. When installing, hook the projection of the shield case into the chassis.

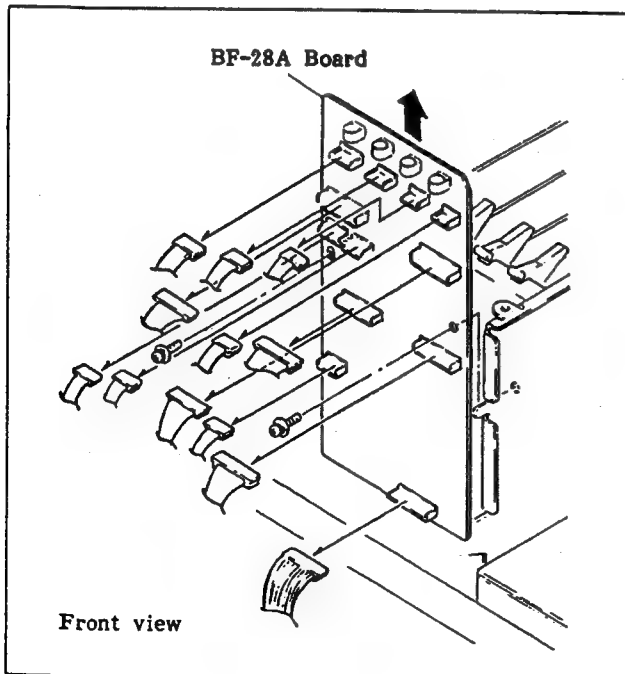


#### BF-28A Board

1. Remove the Upper Panel and Control Panel.
2. Remove the Cassette-up Compartment.
3. Remove the seven fixing screws shown in the figure, remove the control panel chassis.

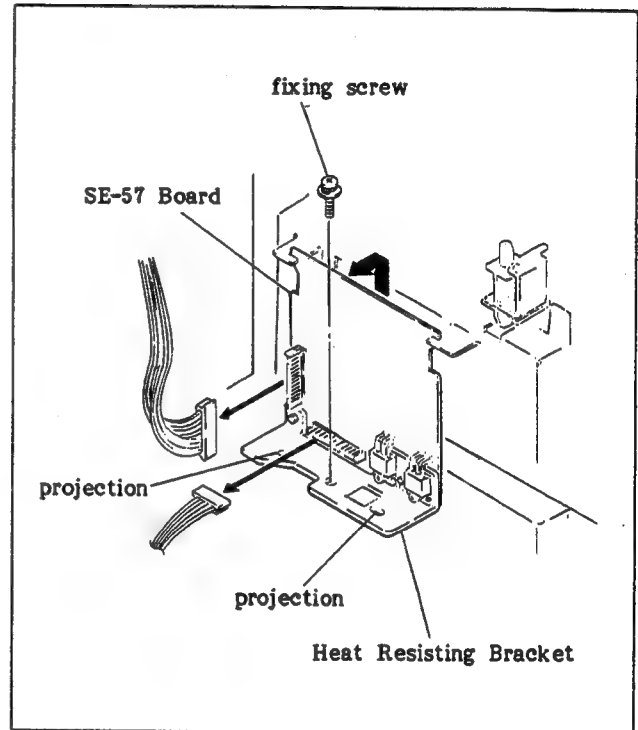


4. Disconnect the connectors.
5. Remove the two fixing screws, remove it from the unit.



#### SE-57 Board

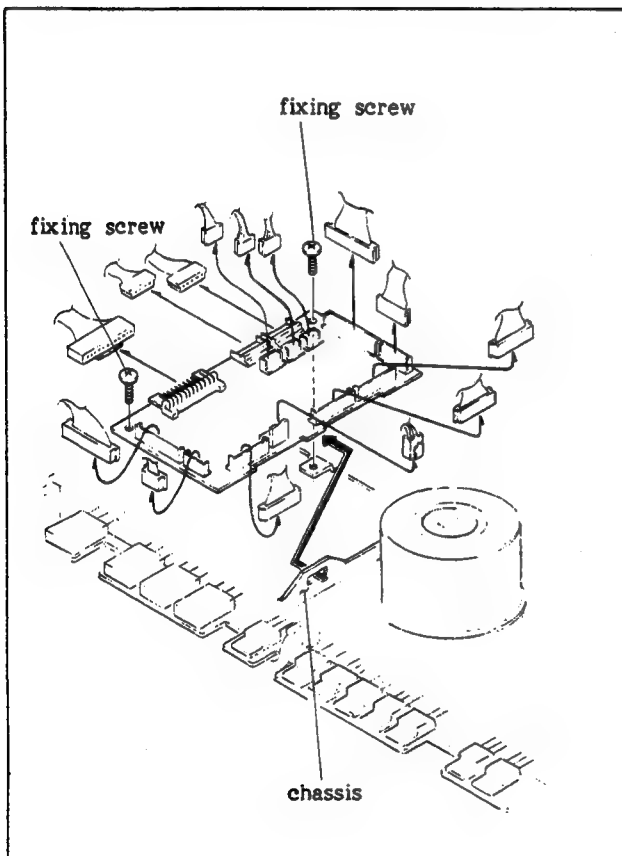
1. Remove the Upper Panel.
2. Remove a fixing screw of the Heat Resisting Bracket.
3. Disconnect the connectors.
4. Remove the SE-57 Board from the unit.
5. When installing, fit the two projections of the Heat Resisting Bracket into the chassis.





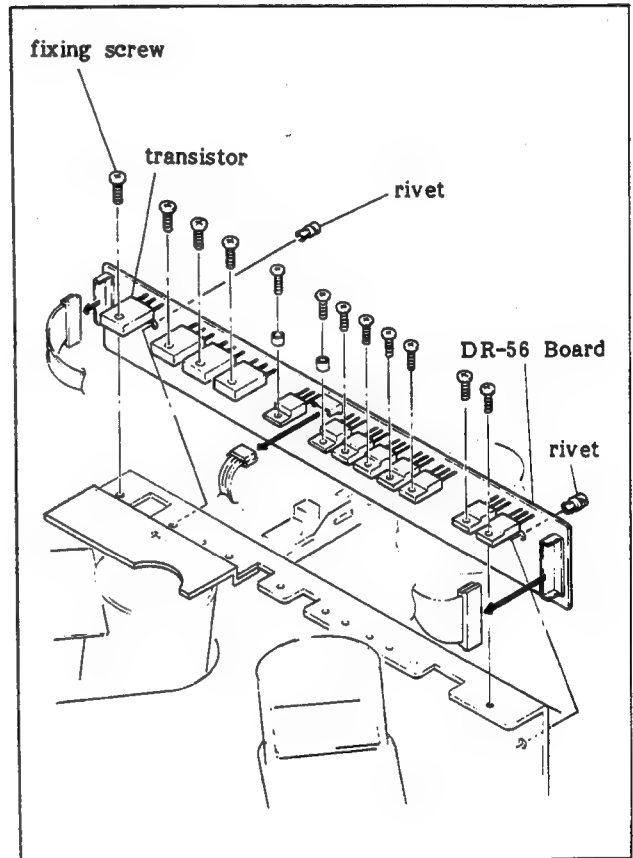
#### RE-28 Board

1. Set the Reel Table to S mode by pressing the REEL POSITION select switch on the SY-61A Board.
2. Remove the SY-61A and SY-64AP Boards.
3. Remove the Lower Panel.
4. Remove the Reel Table Transfer Motor Block.
5. Disconnect the connectors.
6. Remove the two fixing screws and remove the RE-28 Board from the unit.
7. When installing, hook one side of the RE-28 Board into the chassis and tighten the screws.



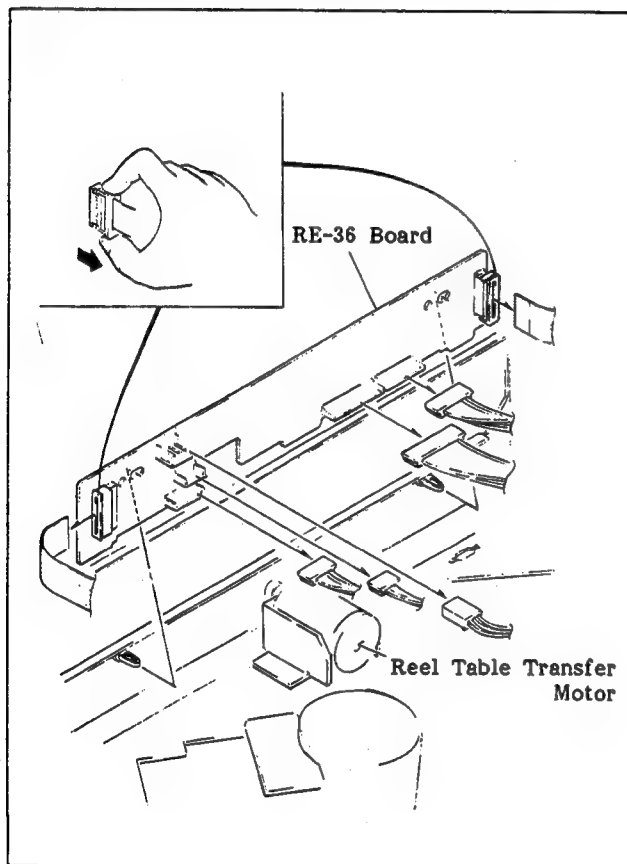
#### DR-56 Board

1. Remove the SY-61A and SY-64AP Boards.
2. Remove the Lower Panel.
3. Disconnect the connectors.
4. Remove the two rivets and twelve fixing screws of the transistors.
5. Remove the DR-56 Board from the unit.



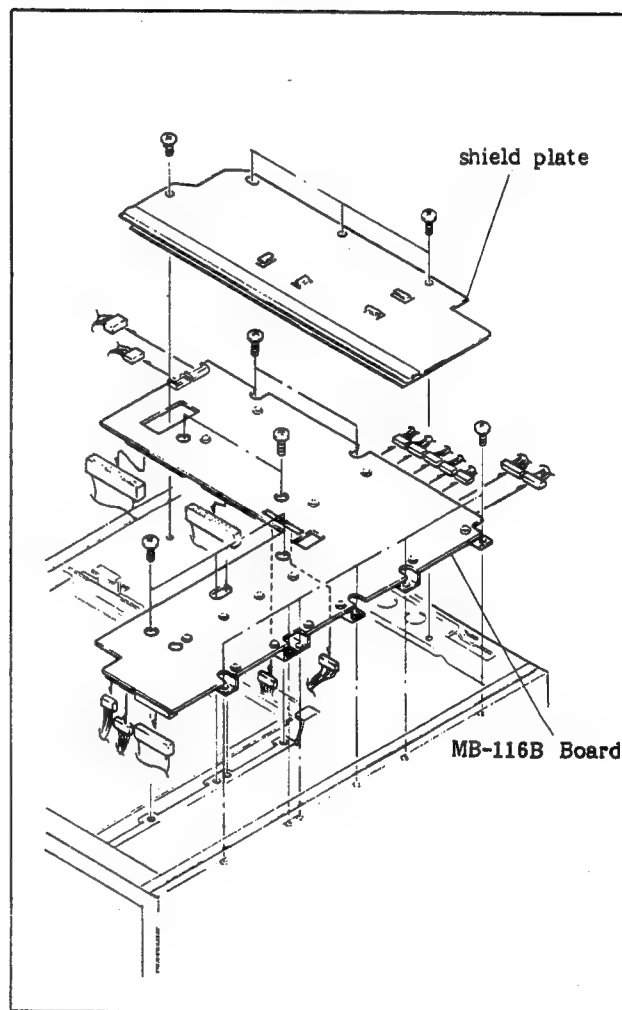
#### RE-36 Board

1. Put the unit into the small cassette mode to turn the Reel Table Transfer Pulley.
2. Remove the SY-61A and SY-64AP Boards.
3. Remove the Lower Panel.
4. Remove the Reel Table Transfer Motor.
5. Remove the RE-36 Board from the unit.
6. Disconnect the connectors and flat cables.



#### MB-191B Board

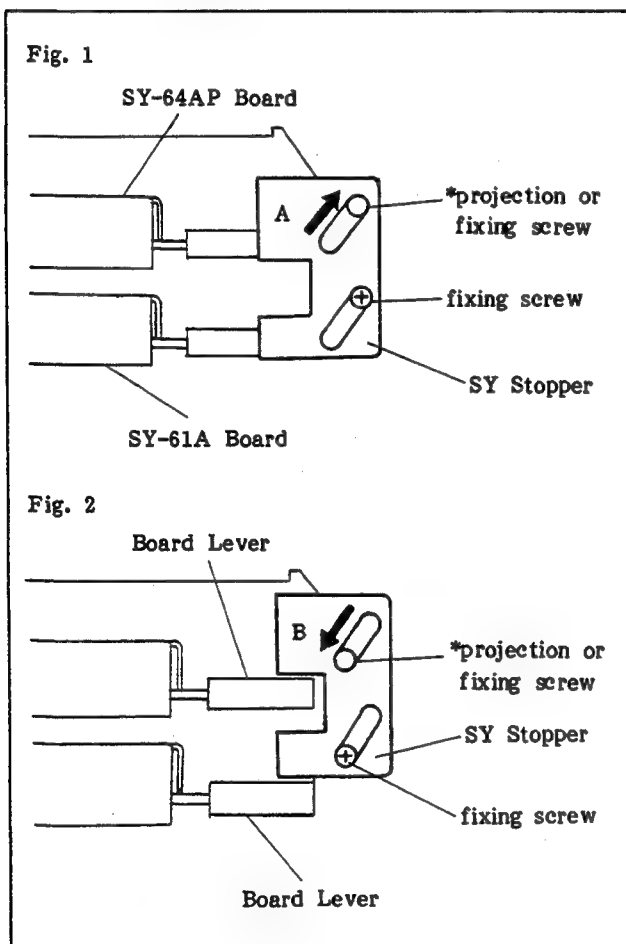
1. Remove the Upper Panel.
2. Remove the plug-in type printed circuit boards.
3. Disconnect the connectors on the inside.
4. Remove the Lower Panel.
5. Remove the shield plate of the MB-191B Board.
6. Remove the fourteen fixing screws of the MB-191B Board.
7. Disconnect the connectors.



#### SY-61A and SY-64AP Boards

1. Open the Function Control Panel.
2. Loosen the fixing screws and slide the SY stopper in the direction indicated by arrow A.
3. Tighten the fixing screws, then remove the SY-61A and SY-64AP Boards.
4. Insert the Boards, then loosen the fixing screws. Slide the SY stopper in the direction indicated by arrow B while slightly pulling the Board Lever toward you.
5. Tighten the fixing screws.

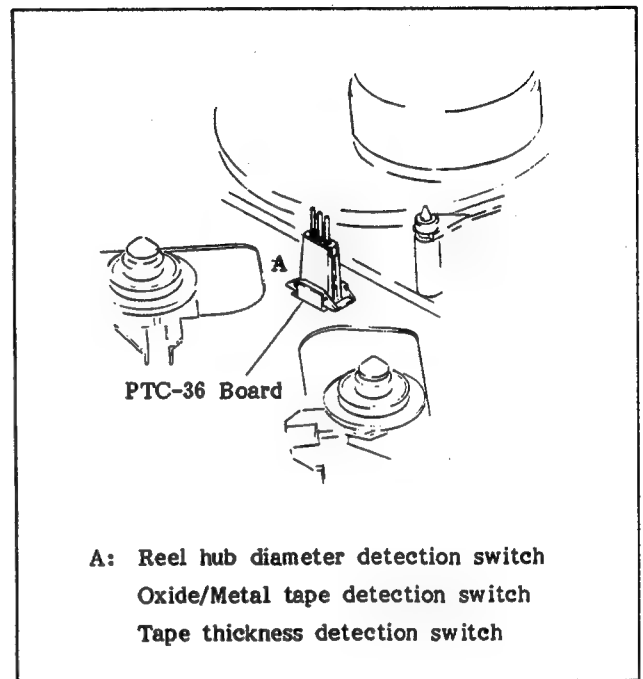
**NOTE:** When the set is transported, be sure to fix the SY stopper as shown in Fig. 1.



\* S/N up to 10160 : projection  
S/N 10161 and higher : fixing screw

#### 4-13. HOW TO REMOVE THE DETECTION SWITCHES

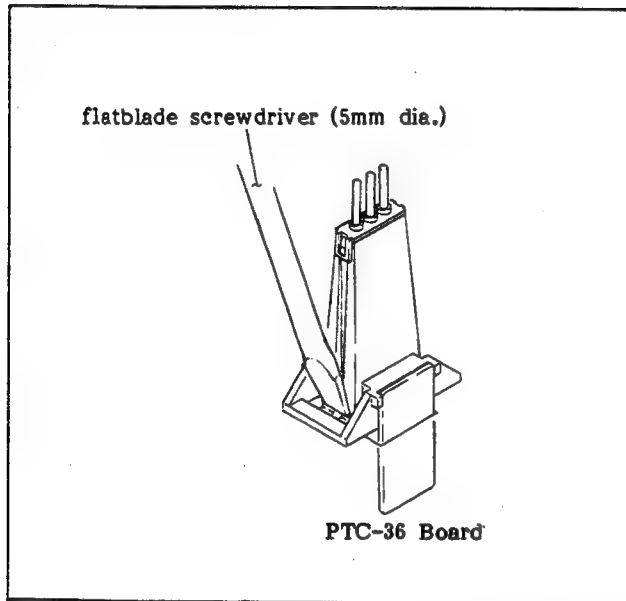
The method of removing of the Detection Switch is described below.



• When removing switch A

While pushing the legs of one side (there are two legs each on the right and left sides) with a flatblade screwdriver (5 mm dia.), lift it. Then pull out the switch.

When installing it, be sure to install the PTC-36 Board in the front side.



**NOTE:** The detection switch lifts lightly so as not to disconnect the connector.

**4-14. NOTE FOR THE SLIP RING**

Handle the slip ring on the drum with care because it is easy to bend.

**4-15. HOW TO OPEN THE CASSETTE LID**

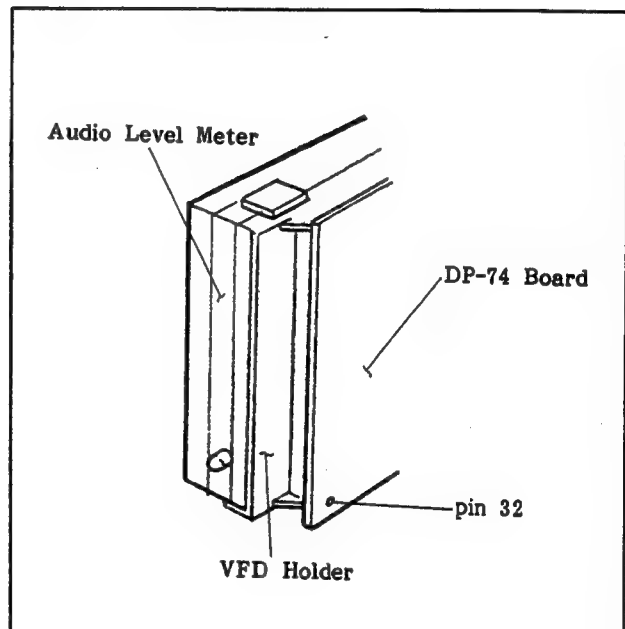
**Large cassette:** The lid is opened by releasing the projecting locks on both sides of the cassette.

**Small cassette:** The lid is opened by releasing the projecting lock on the left side as viewed from the top of the cassette.

**4-16. REPLACEMENT OF AUDIO LEVEL METER**

Repair or replace the audio level meter on the upper left of the front panel and install it on the front chassis as follows:

1. Check that pin 32 of the audio level meter is less than 1mm long from the DP-74 board.
2. If pin 32 is more than 1mm long, it may touch the shield case. Cut off the pin using a nipper so that it is less than 1mm.



#### 4-17. FIXTURE

Part number	Description	For use
J-6001-820-A	Drum Eccentricity Gauge (3)	Upper drum eccentricity adjustment
J-6001-830-A	Drum Eccentricity Gauge (2)	
J-6001-840-A	Drum Eccentricity Gauge (1)	
J-6031-820-A	Multi Connector Cable (BIBNC)	Video alignment
J-6080-011-A	Reel Table Tension Gauge	Brake torque adjustment
J-6086-570-A	Flatness Plate	Audio/TC head slantness adjustment
J-6087-000-A	Drum Eccentricity Gauge (5)	Upper drum eccentricity adjustment
J-6152-450-A	Wire Clearance Gauge	Clearance check
J-6190-800-A	Tension Regulator Slantness Check Tool	Tension regulator slantness check
J-6320-680-A	Reel Table Height Gauge	Reel table height adjustment
J-6320-870-A	Reel Motor Shaft Slantness Check Gauge	Reel motor shaft slantness adjustment
J-6320-880-A	Cassette Reference Plate (L)	Reel table adjustment
2-034-697-00	Cleaning Piece	Cleaning
7-723-902-00	Inspection Mirror	Video tracking adjustment
7-732-050-20	Tension Scale (50 g full scale)	Tension adjustment
7-732-050-30	Tension Scale (100 g full scale)	
8-960-096-51	Alignment Tape, CR2-1B PS	Video tracking tape
8-960-096-86	Alignment Tape, CR8-1B PS	Audio adjustment
8-960-096-91	Alignment Tape, CR5-1B PS	Video, audio and servo alignment for recorder and player (metal particle tape)
8-960-098-44	Alignment Tape, CR5-2A PS	Video and servo alignment for recorder and player (oxide tape)
8-960-098-45	Alignment Tape, CR8-1A PS	Audio alignment for recorder and player (oxide tape)
9-911-053-00	Thickness Gauge	Clearance check
9-919-573-01	Cleaning Fluid	Cleaning
Standard Products	Head Demagnetizer (HE-4)	Head demagnetizing



## SECTION 5

### REPLACEMENT OF MAJOR PARTS

#### 5-1. REPLACEMENT OF THE REEL MOTOR

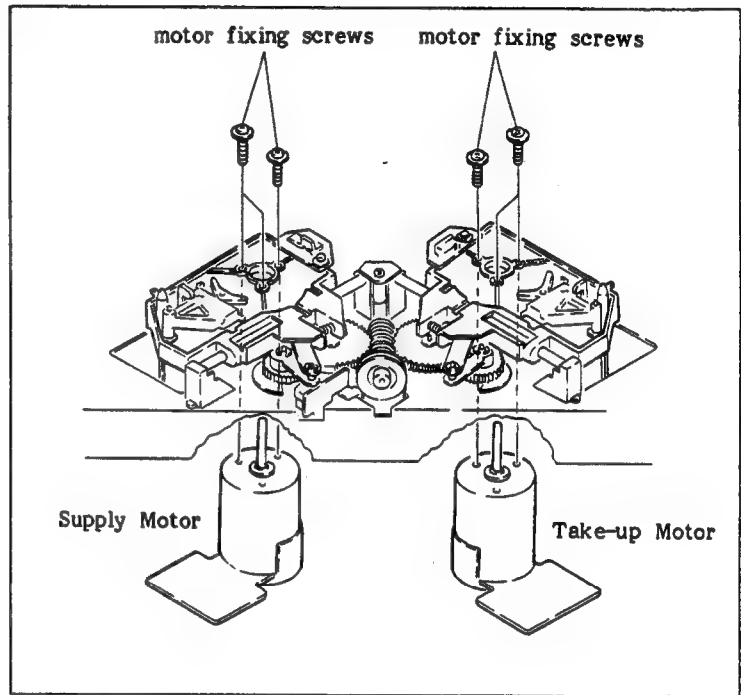
. Replacement procedures for the Take-up Reel Motor and the Supply Reel Motor are the same.

**Tool:** Hex. key (across flat has 1.5 mm)

**Mode:** Unthreading end mode

**Replacement procedure:**

- (1) Open the Function Control Panel, remove the SY-61A and SY-64AP Boards.  
(For the SY-64AP Board, remove the cable from the KY-96B Board on the back of the Control Panel Block.)
- (2) Disconnect the three connectors of the RM-40 Board on the motor from the back of the unit.
- (3) Remove the Reel Table as described in replacement procedures (1) to (4) of Section 5-2, Replacement of the Reel Table.
- (4) Remove the three fixing screws of the motor as shown in the figure, replace it with a new one.
- (5) Perform the adjustments in Section 5-21.



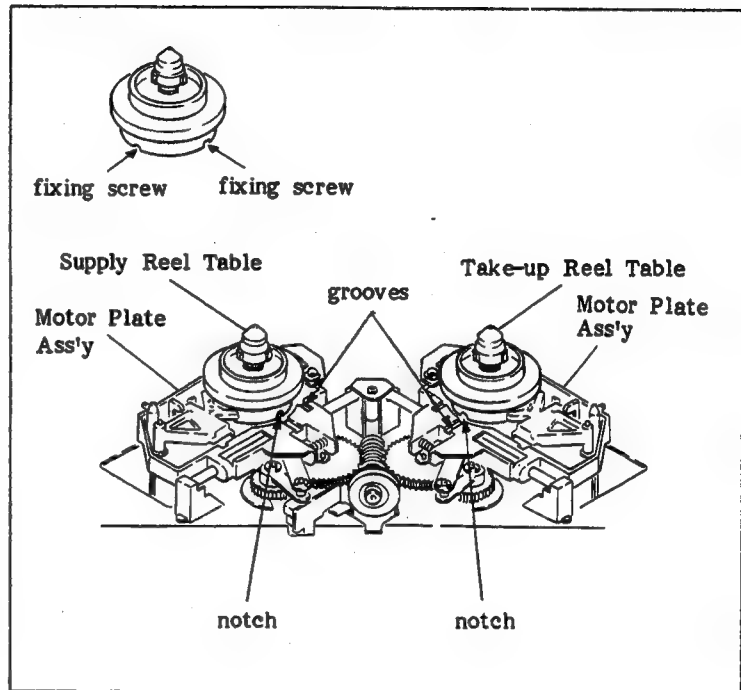
## 5-2. REPLACEMENT OF THE REEL TABLE

- . Replacement procedures for the Take-up Reel Table and the Supply Reel Table are the same.

**Tool:** Hex. key (across flat has 1.5 mm)

### Replacement procedure:

- (1) Turn the Reel Table by hand so that the one of the two notches under the Reel Table is in the groove of the Motor Plate Ass'y.
- (2) Insert the hex. key along the groove into the Reel Table, loosen the fixing screw.
- (3) Turn the Reel Table more so that the other notch is in the groove of the Motor Plate Ass'y.
- (4) Loosen the fixing screw of the Reel Table as described in procedure (2).
- (5) Replace the Reel Table with a new one. (Be careful not to drop the washer.)
- (6) Clean the outer circumference of the Reel Table with a cloth moistened with cleaning fluid.
- (7) Perform the adjustments in Section 5-21.



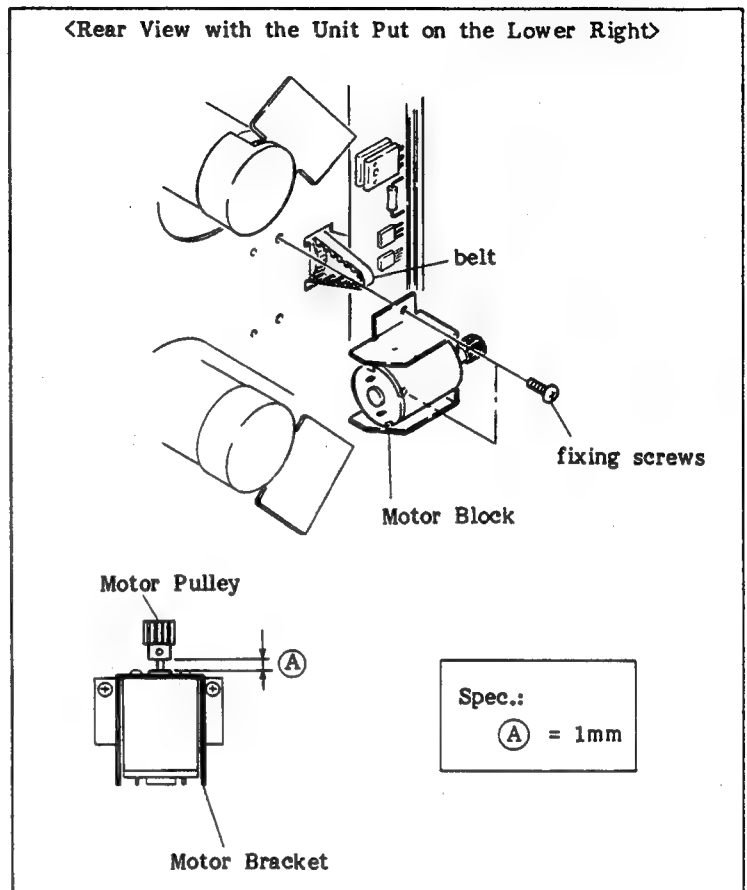


### 5-3. REPLACEMENT OF THE REEL TABLE TRANSFER MOTOR

**Tool:** Hex. key (across flat has 1.27 mm)

#### Replacement procedure:

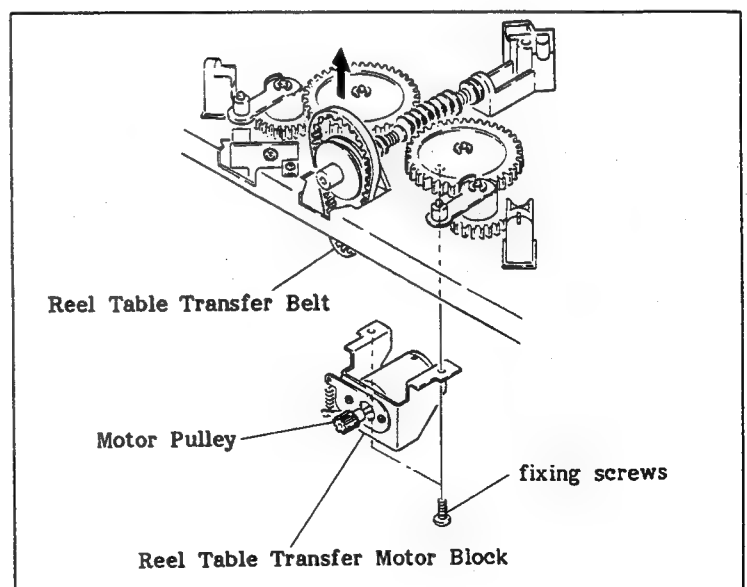
- (1) Remove the SY-61A and SY-64AP Boards, put on the unit right side down.
- (2) Remove the two fixing screws as shown in the figure, remove the Motor Block from the unit.
- (3) Unsolder the two motor leads.
- (4) Remove the setscrew of the Motor Pulley.
- (5) Remove the two fixing screws from the Motor Bracket, replace it with the new one.
- (6) Solder the white lead to the "+" terminal of the motor and the red lead to the other terminal.
- (7) Install the Motor Pulley so that the clearance between the pulley and the Motor meets the required specification.
- (8) Hook the Reel Table Transfer Belt to the Motor Pulley, then install the Motor Block on the unit.



### 5-4. REPLACEMENT OF THE REEL TABLE TRANSFER BELT

#### Replacement procedure:

- (1) Open the Function Control Panel. Remove the SY-61A and SY-64AP Boards from the unit.
- (2) Remove the Reel Table Transfer Motor Block from the back side of the unit.
- (3) Remove the Reel Table Transfer Belt from the top of the unit, replace the belt with a new one.
- (4) Hook the belt to the Motor Pulley of the Reel Table Transfer Motor Block, install it in the unit.

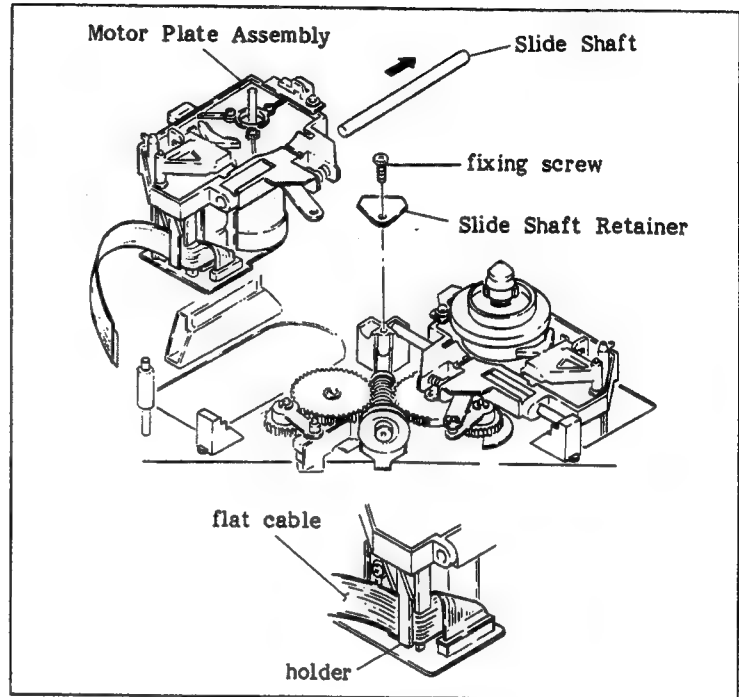


## 5-5. REPLACEMENT OF THE MOTOR PLATE ASSEMBLY

. Replacement procedures for the take-up side and the supply side are the same.

### Replacement procedure:

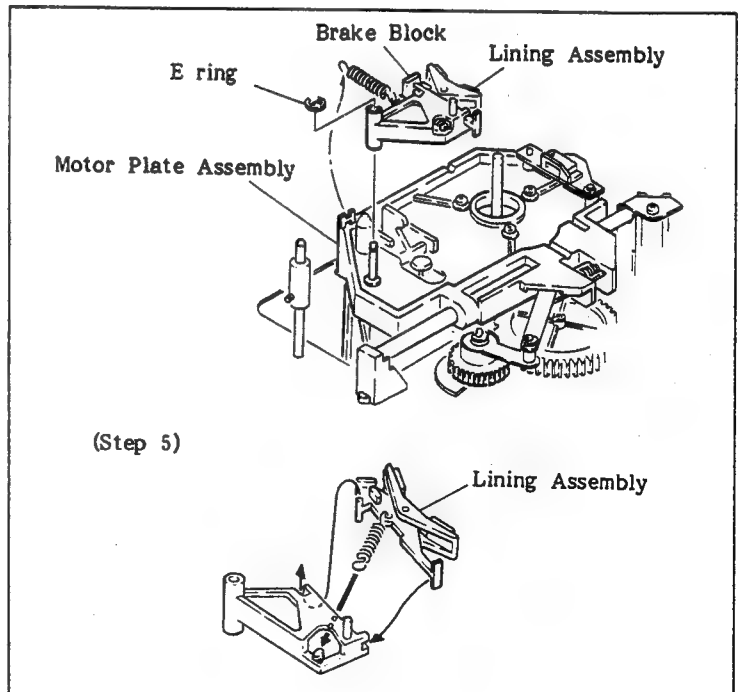
- (1) Remove the Reel Table as described in replacement procedures (1) to (4) of Section 5-2.
- (2) Remove the Slide Shaft Retainer.
- (3) Move the Slide Shaft in the direction of the arrow and remove it. Lift the Motor Plate Ass'y, disconnect the flat cable CN883 on the RM-40 Board.
- (4) Connect the flat cable to the RM-40 Board on the new Motor Plate Ass'y. Insert the flat cable into the holder as shown in the figure.
- (5) Clean the Slide Shaft with a cloth moistened with cleaning fluid.
- (6) Insert the Slide Shaft, and then install it in the unit.
- (7) Install the Slide Shaft Retainer.
- (8) Perform the adjustments in Section 5-21.



## 5-6. REPLACEMENT OF THE REEL TABLE BRAKE

### Replacement procedure:

- (1) Remove the Reel Table as described in replacement procedures (1) to (4) of Section 5-2.
- (2) Remove the E ring as shown in the figure.
- (3) Remove the spring on the Motor Plate Ass'y side.
- (4) Remove the Brake Block.
- (5) Remove the spring of the Brake Block as shown in the figure, then remove the Lining Ass'y.
- (6) Replace it with a new one, reassemble in the reverse order.



## 5-7. REPLACEMENT OF THE UPPER DRUM

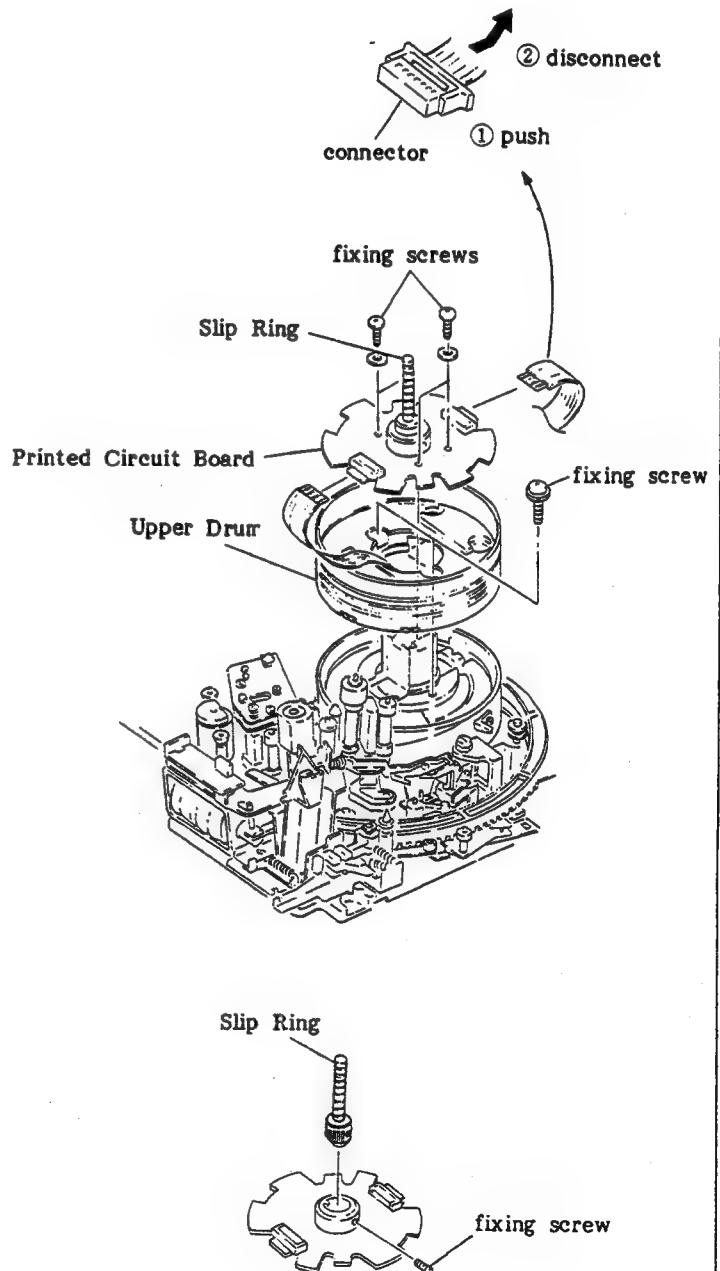
- . The Rotary Video Heads cannot be replaced individually, the entire Upper Drum Assembly must be replaced when any one of these heads fails.
- . The printed circuit board of the Upper Drum Assembly be able to use for the new drum.

**Tool:** Drum eccentricity gauge (1)  
Drum eccentricity gauge (2)  
Drum eccentricity gauge (3)  
Drum eccentricity gauge (5)  
Cleaning fluid  
Cleaning piece

### Replacement procedure:

- (1) Remove the Cleaning Roller Block.
- (2) Disconnect connectors CN661 and CN662 on the SR-26 Board of the Brush Block.
- (3) Remove the Brush Cover and the brush of the Slip Ring Block.
- (4) Remove the fixing screws of the Slip Ring, then remove the Slip Ring.
- (5) Disconnect two connectors on the printed circuit board of the Upper Drum. Remove the four fixing screws of the printed circuit board, then remove the printed circuit board from the Upper Drum Ass'y.
- (6) Remove the two fixing screws of the Upper Drum Ass'y, and then remove the Upper Drum Ass'y from the unit.
- (7) Clean the contacting surfaces of the flange and new Upper Drum Ass'y with a cloth moistened with cleaning fluid. (If there is a spacer between the drum and the flange, it should be remain in place, or be reinstalled in the same place with the new Upper Drum Ass'y. The spacer is 0.01 mm, 0.03 mm, or 0.1 mm.)

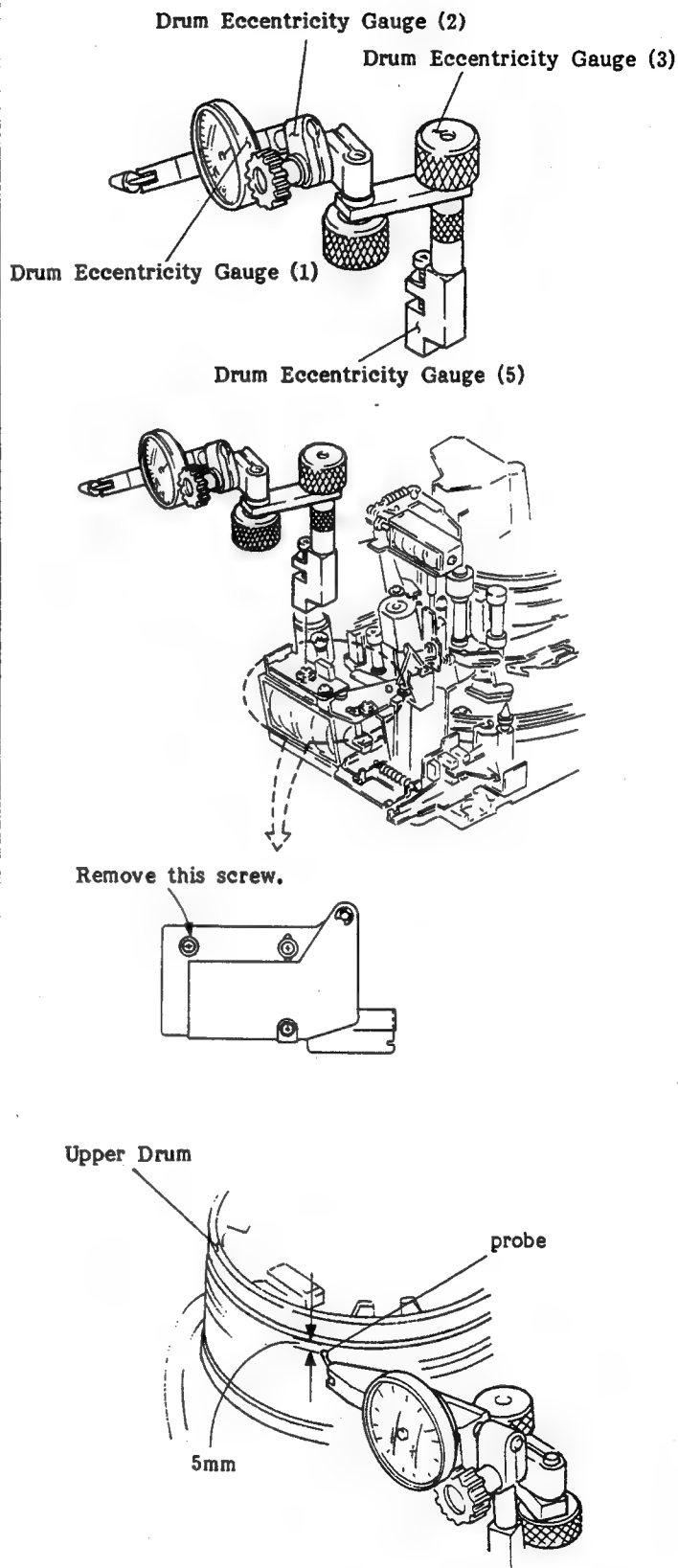
### <Removing the Connector>



- (8) Install the printed circuit board on the Upper Drum Ass'y with four fixing screws so that the marked "A" on the printed circuit board is placed to marked "A" on the Upper Drum Ass'y.
- (9) Place the marked "A" on the printed circuit board with the marked "A" of the Lower Drum Ass'y. Thread snugly with two fixing screws but do not tighten.

**Adjustment procedure:**

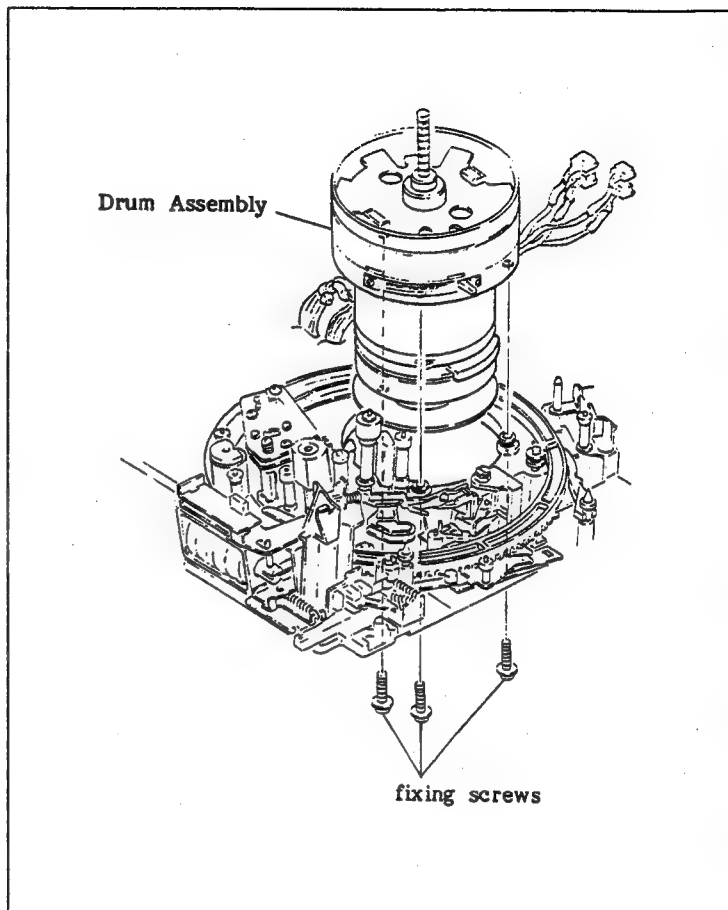
- (1) Assemble the drum eccentricity gauges (1), (2), (3), and (5) as shown in the figure. Remove the screws shown in the figure and mount the assembled gauges in the hole so that the tip probe is positioned about 5 mm from the overmost circumference top edge of the Upper Drum.
- (2) Turn the Upper Drum slowly clockwise direction and confirm that the pointer deflection of the gauge is within 5 microns during one complete turn of the Upper Drum. If this specification is satisfied, proceed to Step (5). If it is not, perform then continue with the remaining Steps.
- (3) Tap the top outer circumference of the Upper Drum with a nylon hammer or a screwdriver handle so that the gauge deflection remains within 5 microns.
- (4) After adjustments, tighten the two fixing screws that secure the Upper Drum alternately and gradually using a tightening torque of 8 kg. cm.
- (5) After the screws are tightened, check again that the eccentricity of the Upper Drum is within 5 microns.
- (6) Connect the two connectors.
- (7) Install the brush, Brush Cover, and Cleaning Roller Block and connect the connectors.
- (8) Perform the adjustments in Section 5-21.



## 5-8. REPLACEMENT OF THE DRUM ASSEMBLY

### Replacement procedure:

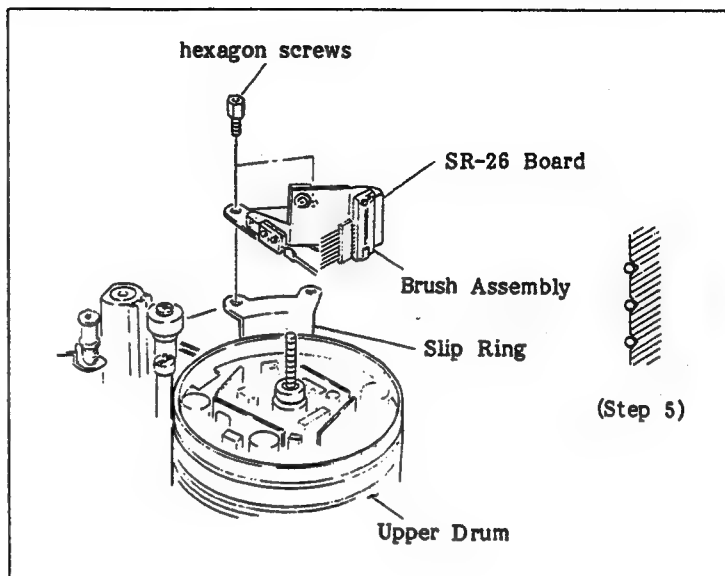
- (1) Remove the Cleaning Roller Block.
- (2) Disconnect connectors CN661 and CN662 on the SR-26 Board of the Brush Block.
- (3) Remove the Brush Cover and the brush of the Slip Ring Block.
- (4) Disconnect connectors CN114, CN115, CN116, and CN117 on the MB-191B Board.
- (5) Disconnect connectors CN812 and CN823 on the RE-28 Board.
- (6) Remove the three fixing screws on the back of the unit, and then remove the defective drum.
- (7) Install the Drum Ass'y on the base. Tighten the fixing screws while turning the Drum Ass'y in a counterclockwise direction as viewed from top of the unit.
- (8) Connect the connectors of the drum harness.
- (9) Install the brush, Brush Cover, and Cleaning Roller Block and connect the two connectors on the SR-26 Board.
- (10) Perform the adjustments in Section 5-21.



## 5-9. REPLACEMENT OF THE BRUSH ASSEMBLY

### Replacement procedure:

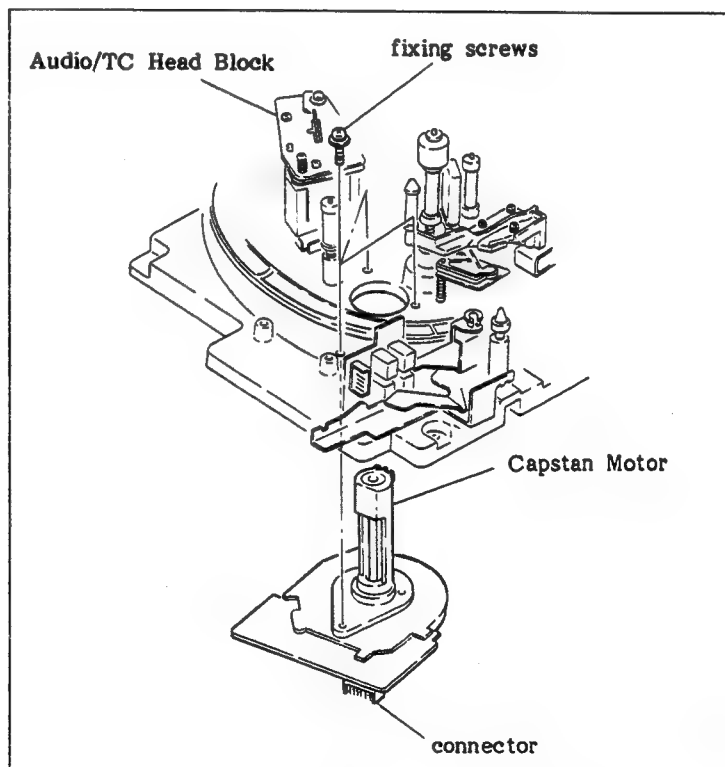
- (1) Remove the Cleaning Roller Block.
- (2) Remove the fixing screw, remove the Brush Cover.
- (3) Disconnect connectors CN661 and CN662 on the SR-26 Board.
- (4) Remove the two hexagon screws, replace the Brush Ass'y with a new one.
- (5) Check that the Brush touches the Slip Ring as shown in the figure.
- (6) Install the Brush Cover, two connectors on the SR-26 Board, and the Cleaning Roller Block.
- (7) Perform the adjustments in Section 5-21.



## 5-10. REPLACEMENT OF THE CAPSTAN MOTOR

### Replacement procedure:

- (1) Open the Function Control Panel, remove the SY-61A and SY-64AP Boards.
- (2) Remove the two fixing screws of the Pinch Solenoid Block, and then remove the Pinch Solenoid Block from the unit.
- (3) Disconnect connector CN1 of the Capstan Motor on the back of the unit.
- (4) Remove the three fixing screws (a fixing screw is under the Pinch Solenoid Block); remove the Capstan Motor from the unit.
- (5) Install the new Capstan Motor. Tighten the three fixing screws while turning the motor in the clockwise direction, as viewed from top of the unit.
- (6) Install the Pinch Solenoid Block in the unit.
- (7) Perform the adjustments in Section 5-21.



## 5-11. REPLACEMENT OF THE AUDIO/TC HEAD

### Replacement procedure:

- (1) Remove the Cleaning Roller Block.
- (2) Remove the two fixing screws of the Audio/TC Head Block, then remove the Audio/TC Head Block from the unit.
- (3) Unsolder the six leads on the PC Board of the Audio/TC Head.
- (4) Remove the two fixing screws as shown in the figure, then remove the Audio/TC Head and Shield Case from the Head Bracket.
- (5) Remove the fixing screw of the Shield Case (P). Remove the Shield Case (P) from the Audio/TC Head Block.
- (6) Replace the Audio/TC Head with a new one.
- (7) Install the Audio/TC Head and Front Shield Plate on the Bracket, then attach the Shield Case (P).
- (8) Install the Audio/TC head in the reverse order of Steps (1) to (3).
- (9) After replacement, perform the adjustments in Section 5-21.

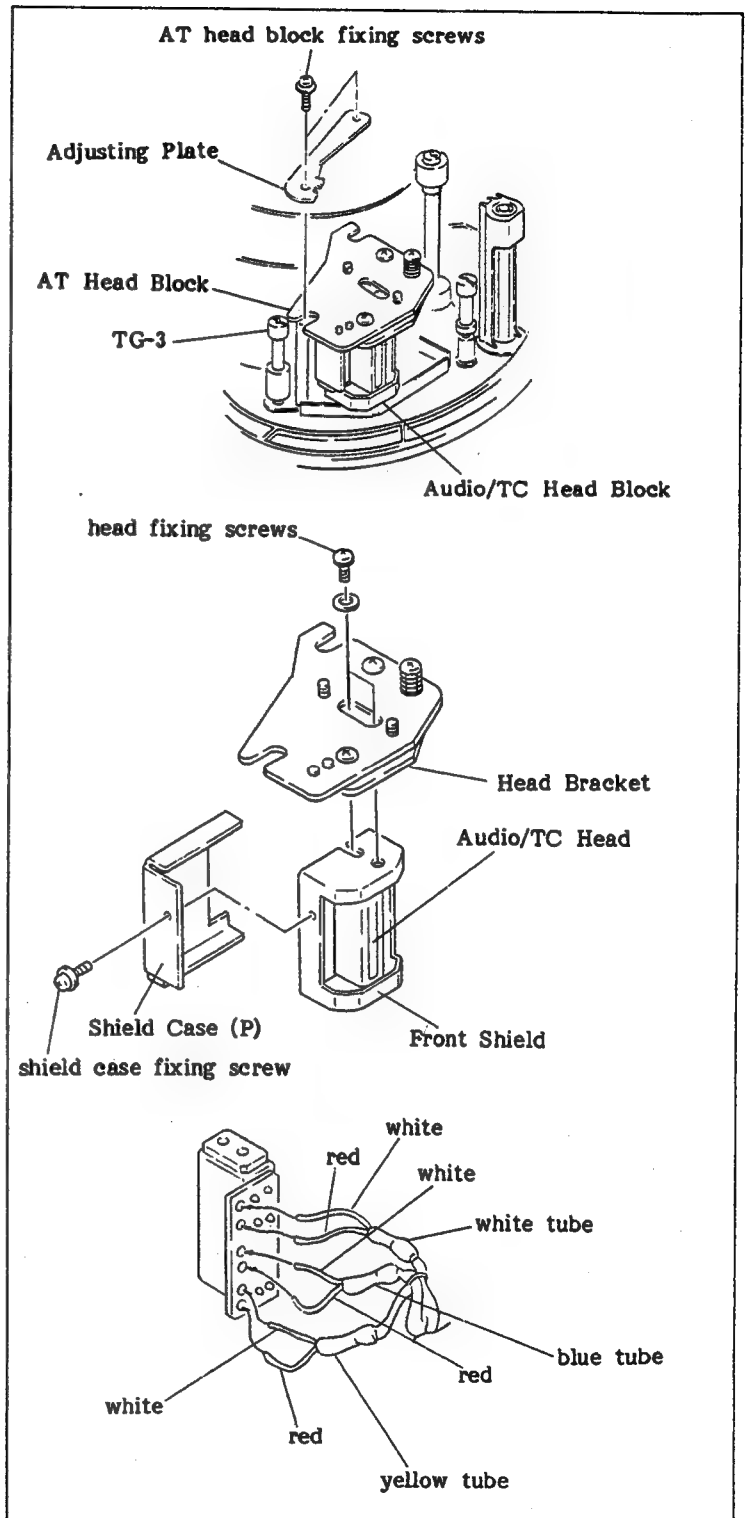
. Perform the preparation as follows:

(i) AU-118P Board

Turn DIP switches S102-Bit 1 and S202-Bit 1 to ON. Turn Bit 2, 3, and 4 of these switches to OFF.

(ii) AU-118P Board

Turn RV110 and RV210 clockwise as far as they will go.

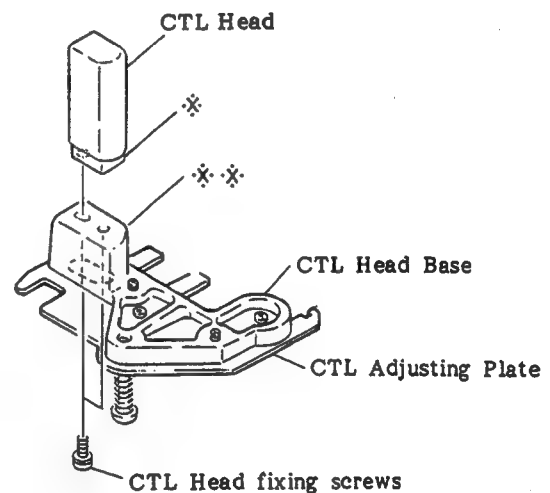
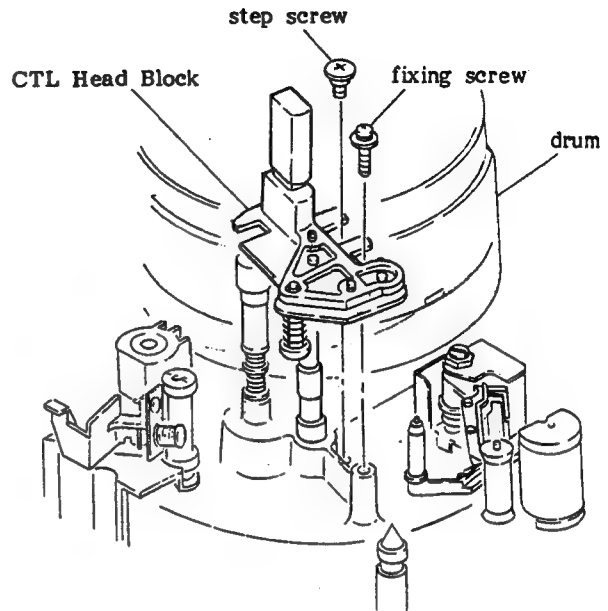


## 5-12. REPLACEMENT OF THE CTL HEAD

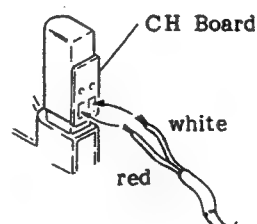
**Mode:** Unthreading end mode

### Replacement procedure:

- (1) Remove the fixing screw and step screw as shown in the figure, remove the CTL Head Block from the unit.
- (2) Unsolder the two leads on the CH Board of the CTL Head.
- (3) Remove the two fixing screws from the CTL Head.
- (4) Replace the CTL Head with a new one. (Install the new CTL Head so that the \* marked portion of the CTL Head is parallel with the \*\* marked portion of the CTL Head Base.)
- (5) Install the CTL Head in the reverse order of Steps (1) to (3).
- (6) After replacement, perform the adjustments in Section 5-21.



(Step 2)



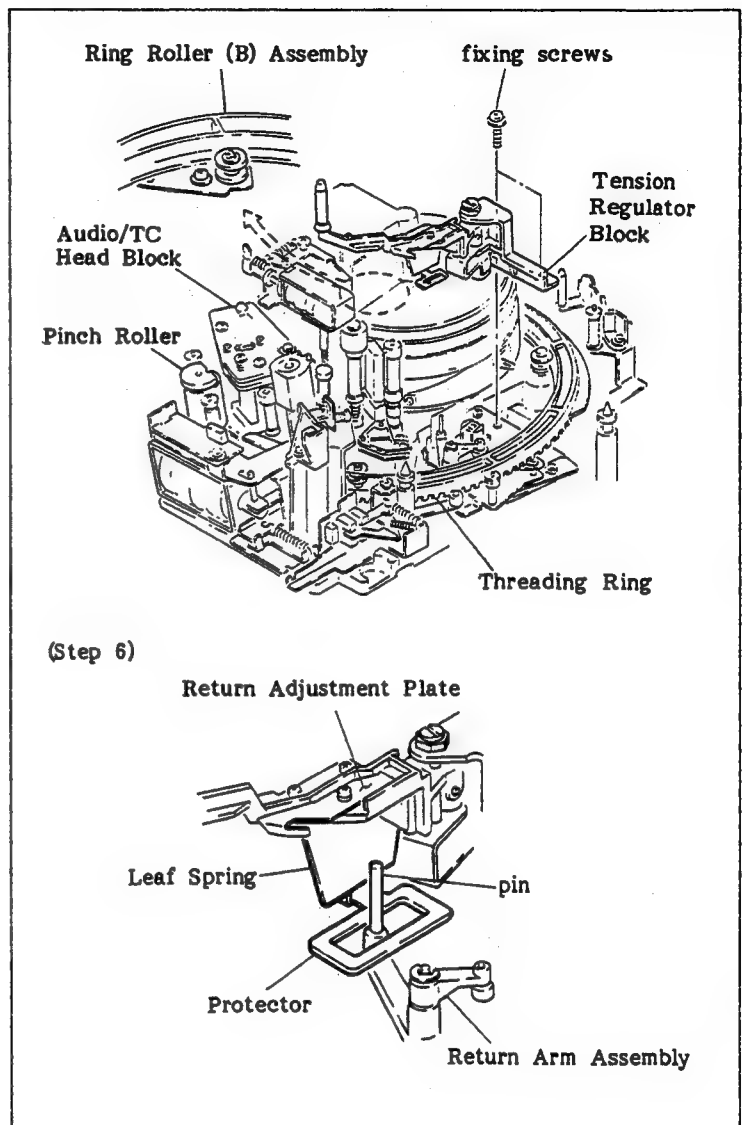
lead	CH board
red	CX
white	CY



### 5-13. REPLACEMENT OF THE TENSION REGULATOR BLOCK

#### Replacement procedure:

- (1) Loosen the two fixing screws of the Gear Box, release the engagement of the Drive Gear and the Threading Ring.
- (2) Turn the Threading Ring so that the Pinch Roller is placed in front of the Audio/TC Head Block.
- (3) Loosen the fixing screw of the Ring Roller (B), release the hold of the Threading Ring.
- (4) Lightly lift the Threading Ring in front of the Supply Reel Table. Remove the two fixing screws of the Tension Regulator Block as shown in the figure.
- (5) Remove the Return Adjustment Plate, protector, and Leaf Spring from the old Tension Regulator Block. Install them in the new one.
- (6) Install the Tension Regulator Block so that the pin of the Return Arm Ass'y is placed into the hole of the protector as shown in the figure.
- (7) Tighten the Ring Roller (B) to the unit. After replacement, perform the adjustments in Section 5-21.



#### 5-14. REPLACEMENT OF THE SUPPLY TENSION ROLLER

**Tool:** Hex. key (across flat has 0.9 mm)

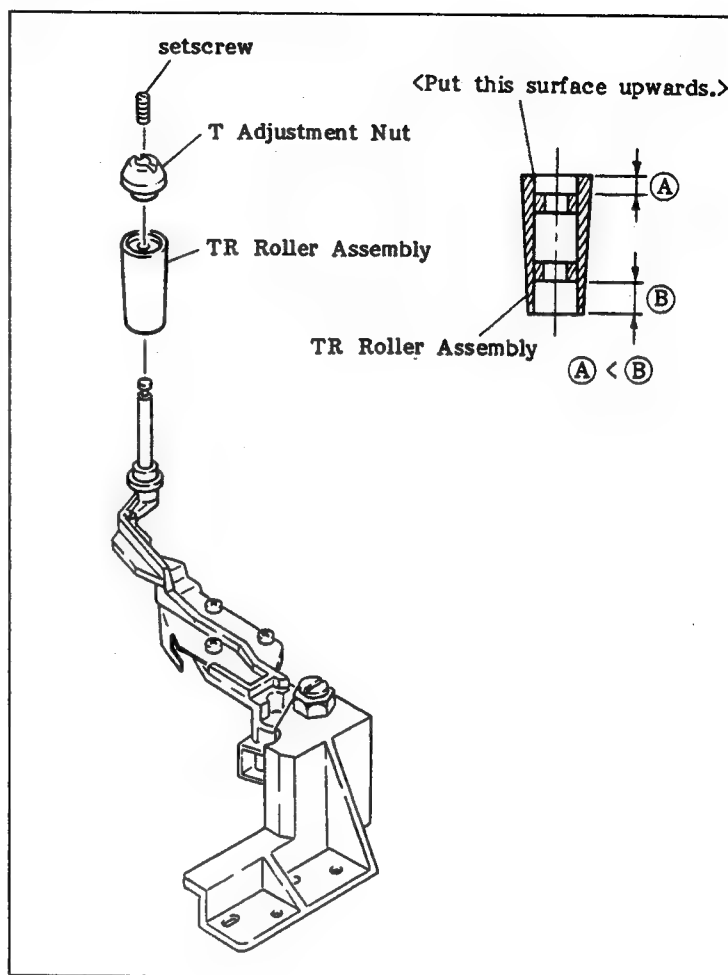
**Replacement procedure:**

- (1) Remove the setscrew as shown in the figure.
- (2) Turn the T Adjustment Nut, then remove it.

- (3) Remove the TR Roller Ass'y, replace it with a new one.

NOTE: Before assembling the TR Roller Ass'y, put the TR Roller Ass'y in the direction as shown in the figure.

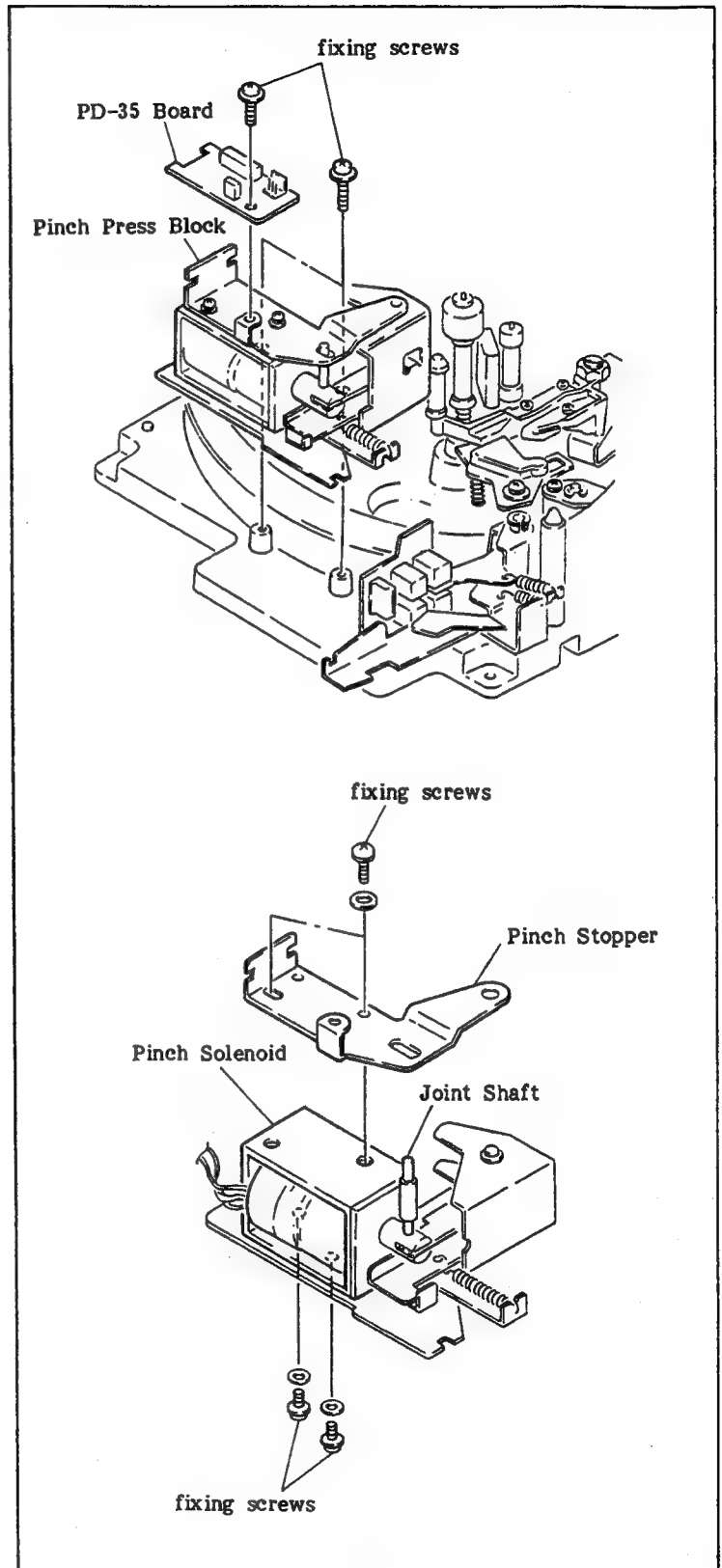
- (4) After replacement, perform the adjustments in Section 5-21.



## 5-15. REPLACEMENT OF THE PINCH SOLENOID

### Replacement procedure:

- (1) Remove the PD-35 Board from the Pinch Press Block.
- (2) Remove the Pinch Press Block from the unit.
- (3) Remove the two fixing screws as shown in the figure, remove the Pinch Stopper.
- (4) Remove the Joint Shaft.
- (5) Remove the two fixing screws. Remove the Pinch Solenoid, replace it with a new one.
- (6) After replacement, perform the adjustments in Section 5-21.

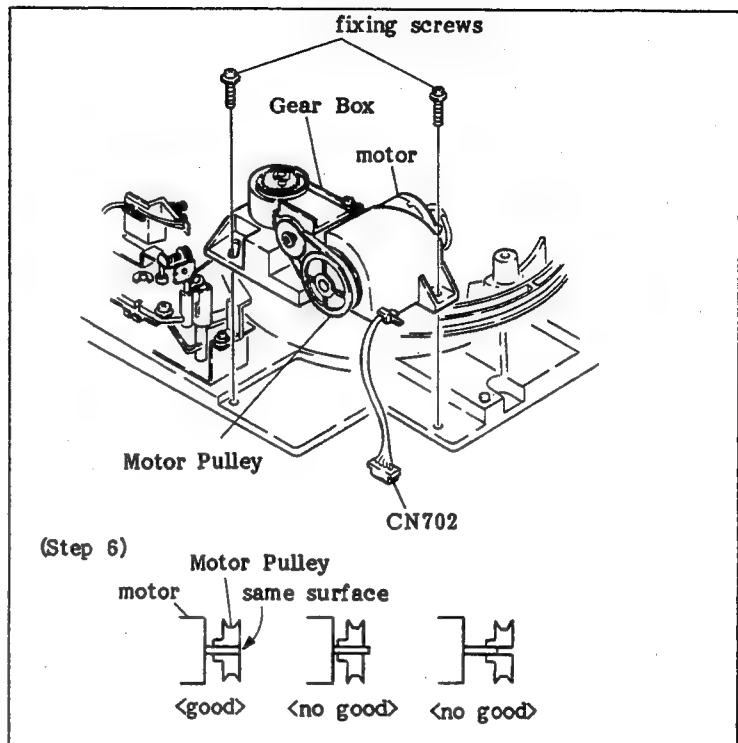


## 5-16. REPLACEMENT OF THE THREADING MOTOR

**Tool:** Hex. key (across flat has 1.27 mm)

### Replacement procedure:

- (1) Disconnect connector CN702 on the SE-57 Board.
- (2) Remove the two fixing screws, then remove the Gear Box from the unit.
- (3) Remove the fixing screw of the Motor Pulley with a hex. key. Remove the pulley and the belt from the Gear Box.
- (4) Unsolder the two leads of the motor.
- (5) Replace the motor with a new one. Solder the gray lead to the "+" terminal and the black lead to the other terminal.
- (6) Install the Motor Pulley so that the end of the Motor Shaft and the Motor Pulley are as shown in the figure.
- (7) Install the Gear Box into the unit. Connect connector CN702 on the SE-57 Board.
- (8) Perform the adjustments in Section 5-21.

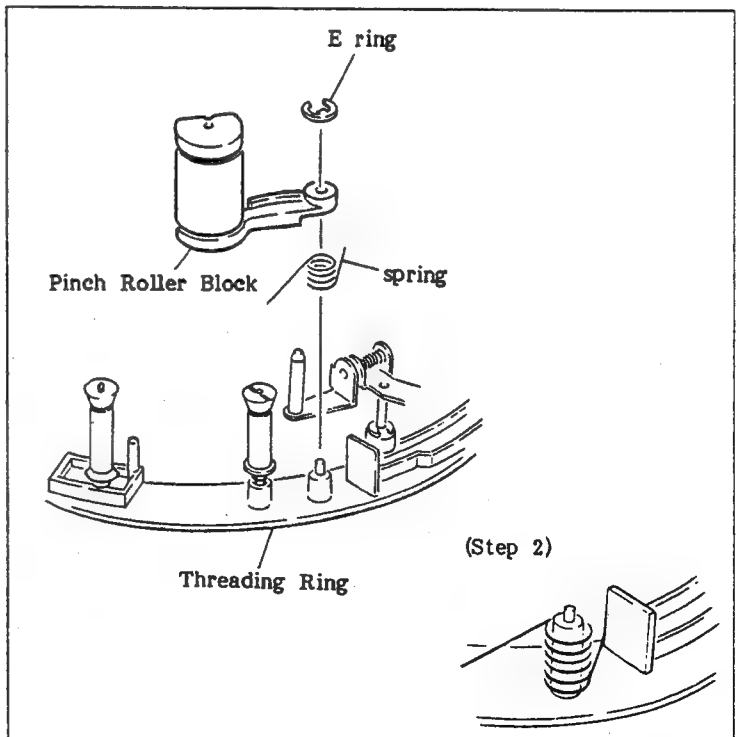


## 5-17. REPLACEMENT OF THE PINCH ROLLER

**Mode:** Unthread end mode (Turn the power OFF.)  
Turn the Motor Pulley of the Gear Box about 5 turns so that the Threading Ring turns a little in the threading direction.

### Replacement procedure:

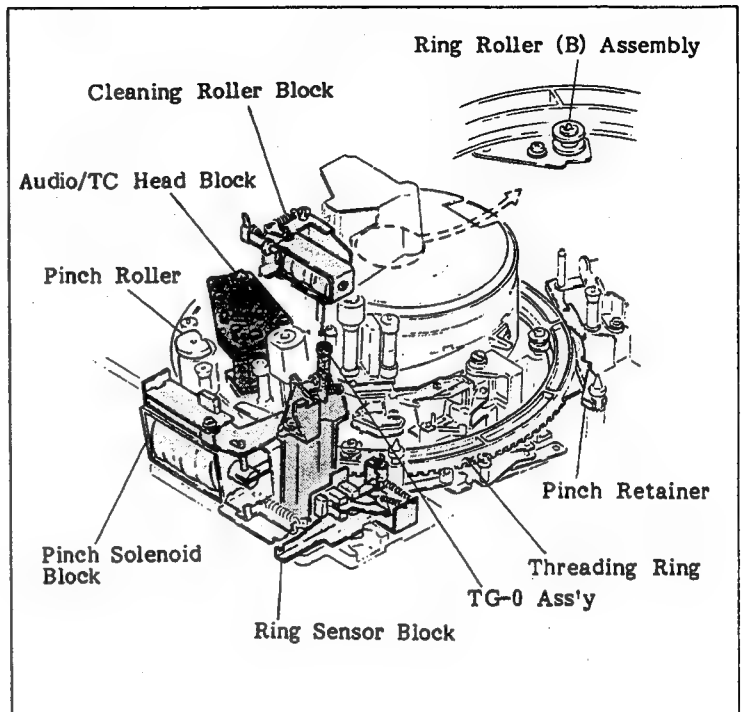
- (1) Remove the E ring on the Threading Ring as shown in the figure, remove the Pinch Roller Block.
- (2) Hook the spring as shown in the figure, install the new Pinch Roller on the Threading Ring.
- (3) After replacement, perform the adjustments in Section 5-21.



## 5-18. REPLACEMENT OF THE THREADING RING

### Replacement procedure:

- (1) Turn the Gear Box Pulley by hand so that the Pinch Roller is in front of the Audio/TC Head.
- (2) Remove the Pinch Retainer, Cleaning Roller Block, Audio/TC Head Block, Pinch Solenoid Block, the Ring Sensor Block, and TG-0 Ass'y.
- (3) Disconnect the two connectors on the Slip Ring Block.
- (4) Loosen the fixing screws of the Gear Box, release the engagement of the Drive Gear and the Threading Ring.
- (5) Loosen the fixing screw of the Ring Roller (B), release the hold of the Threading Ring.
- (6) Remove the Threading Ring, replace it with a new one.
- (7) Install the Ring Sensor while turning in the counterclockwise direction.
- (8) Install the Pinch Solenoid Block, Audio/TC Head Block, and TG-0 Ass'y.
- (9) Insert the two connectors on the Slip Ring Block.
- (10) After replacement, perform the adjustments in Section 5-21.

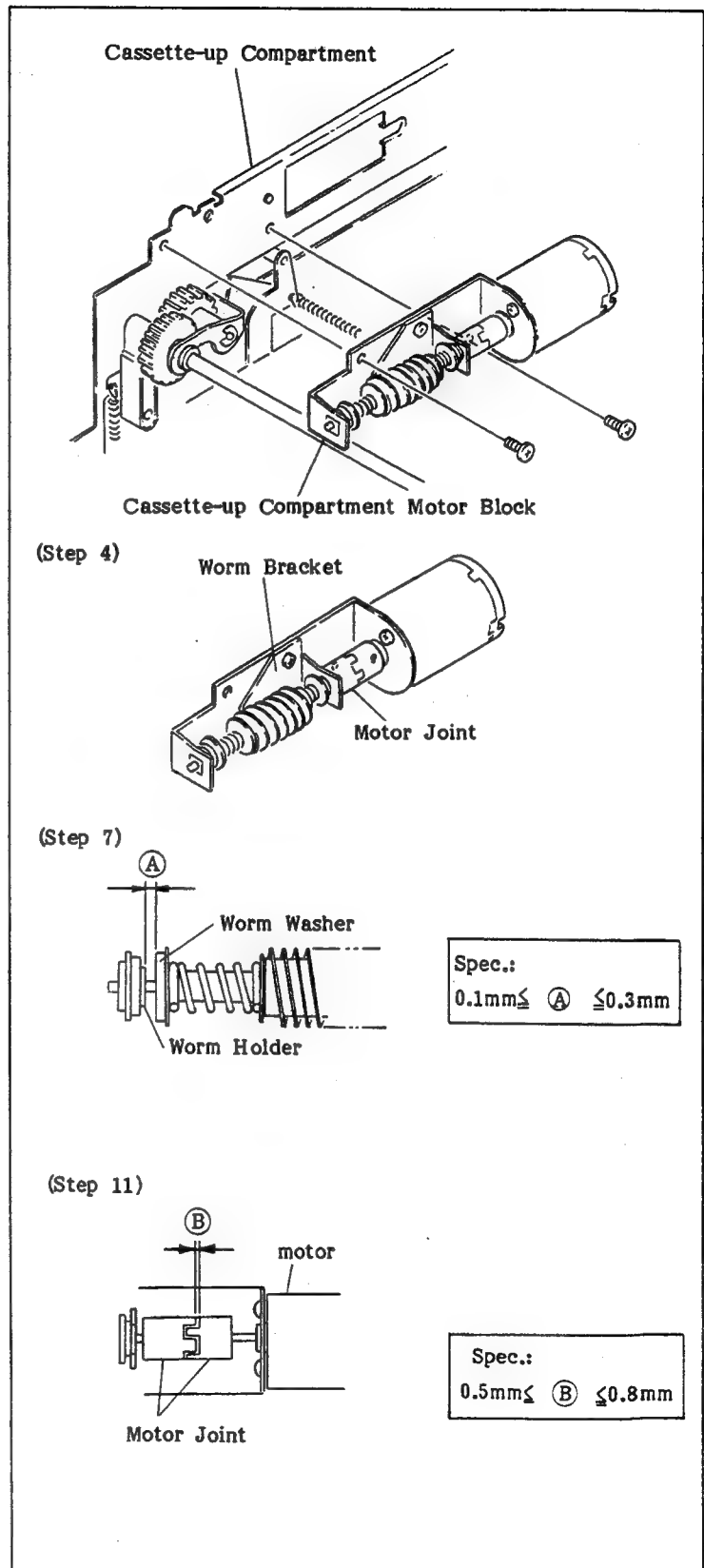


## 5-19. REPLACEMENT OF THE CASSETTE-UP COMPARTMENT WORM GEAR

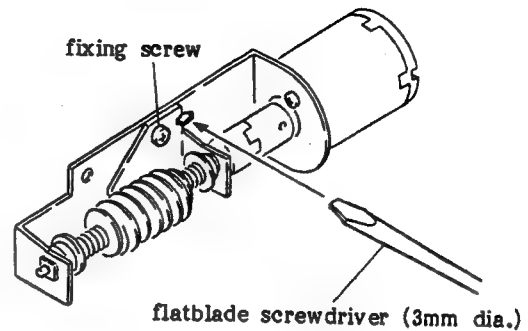
**Tool:** Hex. key (across flat has 1.27 mm)  
DC power (12 V)  
Wire clearance gauge

### Replacement procedure:

- (1) Remove the Cassette-up Compartment from the unit.
- (2) Disconnect the connector on the CCM-2 Board of the Cassette-up Compartment Motor.
- (3) Remove the Cassette-up Compartment Motor Block from the Cassette-up Compartment.
- (4) Loosen the fixing screw of the Motor Joint on the Worm Gear Shaft side.
- (5) Remove the motor.
- (6) Remove the Worm Bracket, replace the defective parts with a new one.
- (7) Install the Worm Bracket in the Cassette-up Compartment Motor Block so that the clearance between the Worm Holder and the Worm Washer meets the required specification.
- (8) Insert the Motor Joint into the Worm Gear Shaft, then install it while pushing the Motor Joint in the direction of the Bracket.
- (9) Insert the motor into the Bracket, engaged at two joints.
- (10) Secure the motor to the Bracket.
- (11) Remove the Motor Joint in the motor side so that the clearance between the two joints meets the required specification.
- (12) Supply the 12VDC power to the connector on the CCM-2 Board of the Cassette-up Compartment Motor.
- (13) Loosen the Worm Mounting Screw about 1/4 turn. Adjust the position of the Worm Bracket with a flatblade screwdriver (3 mm. dia.) so that the current reading is minimized.
- (14) Install the Cassette-up Compartment Motor Block to the Cassette-up Compartment Ass'y, connect the connector to the Cassette-up Compartment Motor.



(Step 13)



## 5-20. REPLACEMENT OF THE CASSETTE-UP COMPARTMENT MOTOR

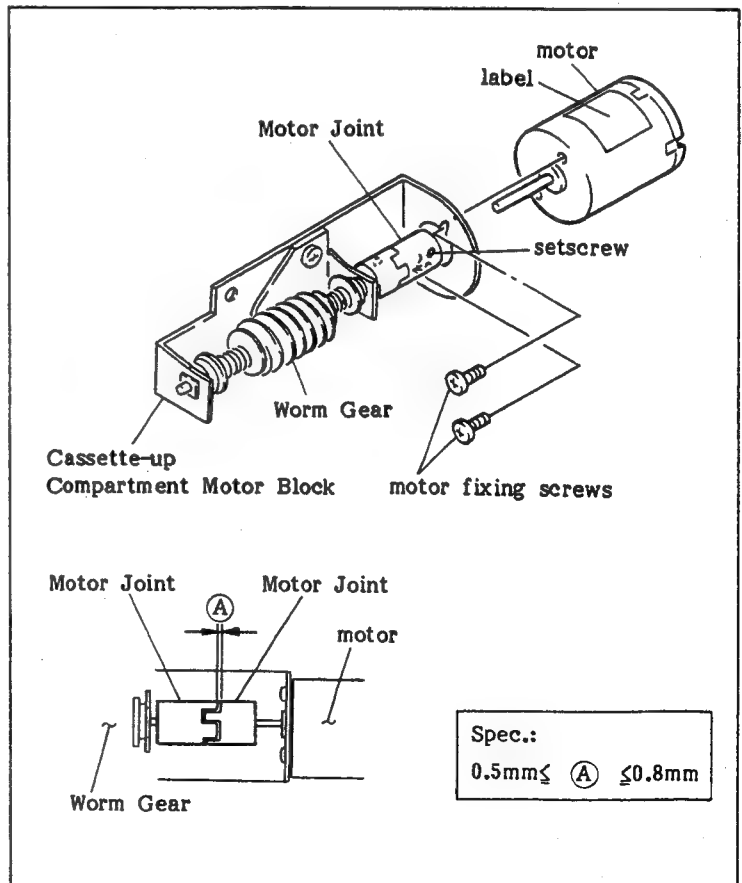
**Tools:** Hex. key (across flat has 1.27 mm)

DC power (12 V)

Wire clearance gauge

### Replacement procedure:

- (1) Disconnect the connector on the CCM-2 Board of the Cassette-up Compartment Motor.
- (2) Remove the Cassette-up Compartment Motor Block from the Cassette-up Compartment.
- (3) Loosen the fixing screws of the motor, and then remove the motor.
- (4) Thread the Motor Joint snugly but do not tighten to the shaft of the new motor, then insert the Motor Joint into the bracket. (Install it so that the label on the Motor is located as shown in the figure.)
- (5) Adjust the position of the Motor Joint on the motor side so that the clearance between the Motor Joints on the Worm Gear side and the motor side meets the required specification.
- (6) Install the Cassette-up Compartment Motor Block to the Cassette-up Compartment.



## 5-21. ITEMS TO BE ADJUSTED AFTER MAIN PARTS REPLACEMENT

. Numbers in parenthesis refer to Section Nos.

### Replacement of the Reel Motor

Reel Motor Shaft Slantness Adjustment (6-1-3) —> Reel Table Height Adjustment (6-1-4) —> Reel Rotation Detector Block Position Adjustment (6-1-5) —> Reel Table Brake Clearance Adjustment (6-2-1) —> Supply Brake Torque Adjustment (7-1-1) or Take-up Brake Torque Adjustment (7-1-2) —> Reel Torque Adjustment (7-2) —> Video Tracking Adjustment (Check) (8-1)

### Replacement of the Reel Table

Reel Table Height Adjustment (6-1-4) —> Reel Rotation Detector Block Position Adjustment (6-1-5) —> Reel Table Brake Clearance Adjustment (6-2-1) —> Supply Brake Torque Adjustment (7-1-1) or Take-up Brake Torque Adjustment (7-1-2) —> Video Tracking Adjustment (Check) (8-1)

### Replacement of the Motor Plate Assembly

Cassette Holder Height Adjustment (L) (6-1-1) —> Cassette Holder Height Adjustment (S) (6-1-2) —> Reel Table Height Adjustment (6-1-4) —> Reel Rotation Detector Block Position Adjustment (6-1-5) —> Reel Table Brake Clearance Adjustment (6-2-1) —> Reel Table Brake Release Adjustment (6-2-2) —> Supply Brake Torque Adjustment (7-1-1) —> Take-up Brake Torque Adjustment (7-1-2) —> Reel Torque Adjustment (7-2) —> Video Tracking Adjustment (Check) (8-1)

### Replacement of the Reel Table Brake

Reel Table Brake Clearance Adjustment (6-2-1) —> Reel Table Brake Release Adjustment (6-2-2) —> Supply Brake Torque Adjustment (7-1-1) or Take-up Brake Torque Adjustment (7-1-2)

### Replacement of the Upper Drum

Slip Ring Block Brush Position Adjustment (8-5) —> Video Tracking Adjustment (8-1) —> CTL Head Position Adjustment (8-3-3) —> Audio/TC Head Position Adjustment (8-2-5) —> Cleaning Roller Position Adjustment (6-9) —> C Switching Position Adjustment (10-15) —> Picture Splitting Compensation Adjustment (10-16) —> Video System Adjustment



#### **Replacement of the Drum Assembly**

Slip Ring Block Brush Position Adjustment (8-5) → Video Tracking Adjustment (8-1) (Adjust as described in "Tracking Adjustment".) → CTL Head Position Adjustment (8-3-3) → Audio/TC Head Position Adjustment (8-2-5) → Cleaning Roller Position Adjustment (6-9) → C Switching Position Adjustment (10-15) → Picture Splitting Compensation Adjustment (10-16) → Video System Adjustment

#### **Replacement of the Brush Assembly**

Slip Ring Block Brush Position Adjustment (8-5)

#### **Replacement of the Audio/TC Head Block**

Audio/TC Head Zenith Adjustment (8-2-2) → Audio/TC Head Height Adjustment (8-2-1) → Audio/TC Head Azimuth Adjustment (8-2-3) → Audio/TC Head Phase Adjustment (8-2-4) → Video Tracking Adjustment (Check) (8-1) → Audio/TC Head Position Adjustment (8-2-5) → Audio System Adjustment → Time Code System Adjustment → Cleaning Roller Position Adjustment (6-9)

#### **Replacement of the CTL Head**

CTL Head Azimuth/Zenith Adjustment (8-3-2) → CTL Head Height Adjustment (8-3-1) → Video Tracking Adjustment (8-1) → CTL Head Position Adjustment (8-3-3) → Audio/TC Head Position Adjustment (8-2-5)

#### **Replacement of the Tension Regulator Block**

Threading Ring Rotation Adjustment (6-4) → Gear Box position Adjustment (6-5) → Pinch Roller Press Block Position Adjustment (6-6) → Tension Regulator Arm Position Adjustment (6-3-1) → Tension Regulator Arm Slantness Adjustment (6-3-2) → Tension Sensor Position Adjustment (6-7) → Tension Sensor Sensitivity Adjustment (6-8) → Video Tracking Adjustment (8-1) → Cleaning Roller Position Adjustment (6-9)

#### **Replacement of the S Tension Roller**

Video Tracking Adjustment (8-1)

#### **Replacement of the Pinch Solenoid**

Pinch Roller Press Block Position Adjustment (6-6)

#### **Replacement of the Capstan Motor**

Pinch Roller Press Block Position Adjustment (6-6) → Servo System Adjustment → Video Tracking Adjustment (8-1)

#### **Replacement of the Threading Motor**

Gear Box Position Adjustment (6-5)

### **Replacement of the Pinch Roller**

Pinch Roller Press Block Position Adjustment (6-6) —> Video Tracking Adjustment (8-1)

### **Replacement of the Threading Ring**

Threading Rotation Adjustment (6-4) —> Gear Box Position Adjustment (6-5) —> Pinch Roller Press Block Position Adjustment (6-6) —> Audio/TC Head Zenith Adjustment (8-2-2) —> Audio/TC Head Height Adjustment (8-2-1) —> Audio/TC Head Azimuth Adjustment (8-2-3) —> Audio/TC Head Phase Adjustment (8-2-4) —> Position Adjustment (8-2-5) —> Video Tracking Adjustment (8-1) —> Cleaning Roller Position Adjustment (6-9)



## SECTION 6

### LINK AND DRIVE SYSTEM ALIGNMENT

#### ALIGNMENT INFORMATION

#### MODES

##### Unthreading end mode

This indicates the EJECT completion mode. At the time of ejection, the tension regulator arm and threading ring are completely returned to the cassette tape side.

##### Threading mode

When the STOP button is pressed, the threading ring rotates counterclockwise.

##### Threading end mode (STOP mode)

When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is then stopped.

##### PLAY mode without a cassette tape

- (1) Remove the Cassette-up Compartment (refer to Section 4-2).
- (2) Set DIP switch S106 on the SY-61A Board to ON.
- (3) Set System Setup \*Item 902 to 1.  
(At that time, message "Error" appears on the time counter display of the front panel. The unit is activated normally irrespective of its message.)
- (4) When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is stopped. The STANDBY lamp then lights, and the unit enters the STOP mode.
- (5) When the PLAY button is pressed, the pinch roller is pressed against the capstan shaft, and the unit enters the PLAY mode.
- (6) After adjustment is completed, set System Setup \*Item 902 to 0.
- (7) Set DIP switch S106 on the SY-61A Board to OFF.
- (8) Install the Cassette-up Compartment.

##### STANDBY OFF mode without a cassette tape

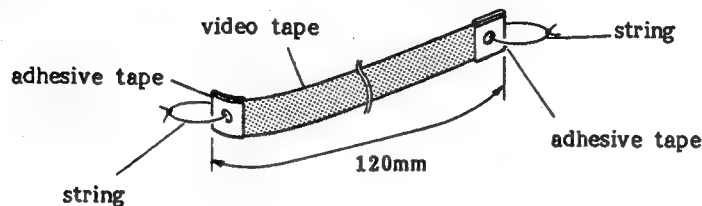
- (1) Put the unit into the STOP mode without a cassette tape (refer to Steps 1 through 4 described above).
- (2) Press the STANDBY button after the STANDBY lamp lights.  
The STANDBY lamp then goes off, and the unit enters the STANDBY OFF mode in which the drum rotation is stopped.
- (3) After adjustment is completed, set System Setup \*Item 902 to 0.
- (4) Set DIP switch S106 on the SY-61A Board to OFF.
- (5) Install the Cassette-up Compartment.

##### REV mode without tape

- (1) Put the unit into the STOP mode without a cassette tape.
- (2) Turn the search dial counterclockwise. The unit then enters the REV mode.
- (3) After adjustment is completed, set System Setup \*Item 902 to 0.
- (4) Set DIP switch S106 on the SY-61A Board to OFF.
- (5) Install the Cassette-up Compartment.

### Creating the locally-produced-tape

- (1) Prepare a 12cm-long video tape (used out tape is acceptable).
- (2) As shown in the figure, attach adhesive tape across the video tape and make holes in it.
- (3) Make a 10cm-long loop of string through the holes.



### \* Item 902

For setting, refer to the Setup in 1-7-1. To display this item, turn the SEARCH dial while pressing the PLAY button.

Note: Item 900 series are used only at the factory. Setting should not be thus changed.

When setting is changed, be sure to return it to the initial value.

## 6-1. REEL TABLE SYSTEM ADJUSTMENT

### 6-1-1. Cassette Holder Height Adjustment (L)

**Tool:** Cassette reference plate (L)  
Hex. key (across flat has 1.5 mm)  
Thickness gauge

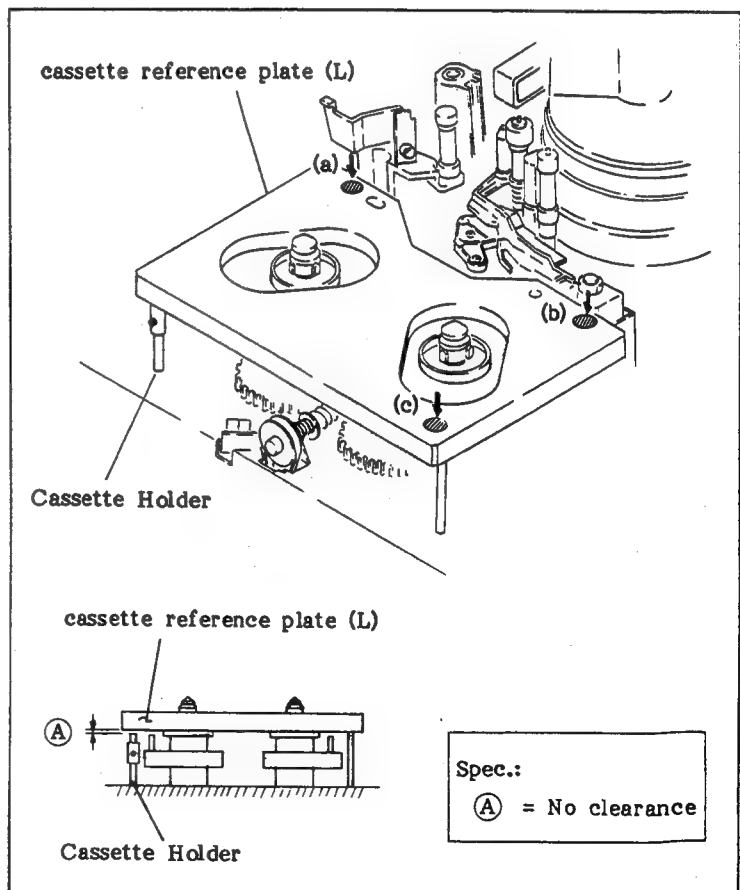
**Mode:** Unthreading end mode

#### Check procedure:

- (1) Install the cassette reference plate (L) at the position for the cassette.
- (2) While lightly pushing the cassette reference plate (L) marked (a), (b), and (c) toward the chassis, check that the clearance between the cassette reference plate (L) and the Cassette Holder meets the required specification.

#### Adjustment procedure:

- (1) Adjust the height of the Cassette Holder to meet the required specification.



## 6-1-2. Cassette Holder Height Adjustment (S)

. It is required that Section 6-1-1, Cassette Holder Height Adjustment (L) is completed before initiating this adjustment.

**Tool:** Cassette reference plate (L)  
Hex. key (across flat has 1.5 mm)  
Inspection mirror

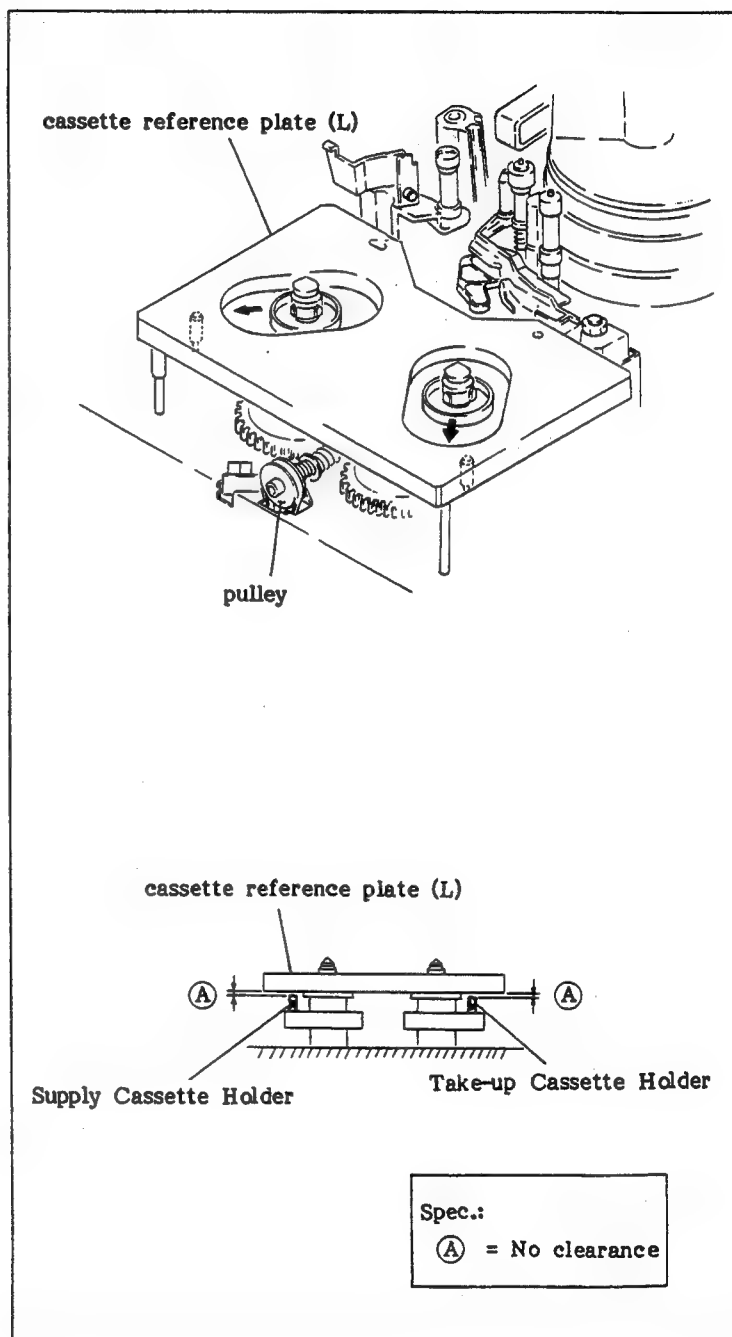
**Mode:** Unthreading end mode

### Check procedure:

- (1) Install the cassette reference plate (L) at the position for the cassette.
- (2) Turn the pulley by hand so that the Reel Table moves to the position as shown in the figure.
- (3) Insert the cassette reference plate (L) in the Take-up Motor Plate Ass'y, check that there is no clearance between the Cassette Holder for the small cassette and the cassette reference plate (L).
- (4) In the Supply Motor Plate Ass'y, check that there is no clearance between the Cassette Holder for the small cassette and the cassette reference plate (L).

### Adjustment procedure:

- (1) Adjust the height of the Cassette Holder so that there is no clearance between the cassette reference plate (L) and the Cassette Holder.



### 6-1-3. Reel Motor Shaft Slantness Adjustment

. This adjustment is usually not required. Proceed with the following steps only when the Reel Motor is replaced.

**Tool:** Cassette reference plate (L)  
Reel motor shaft slantness check gauge  
Hex. key (across flat has 1.5 mm)  
Thickness gauge

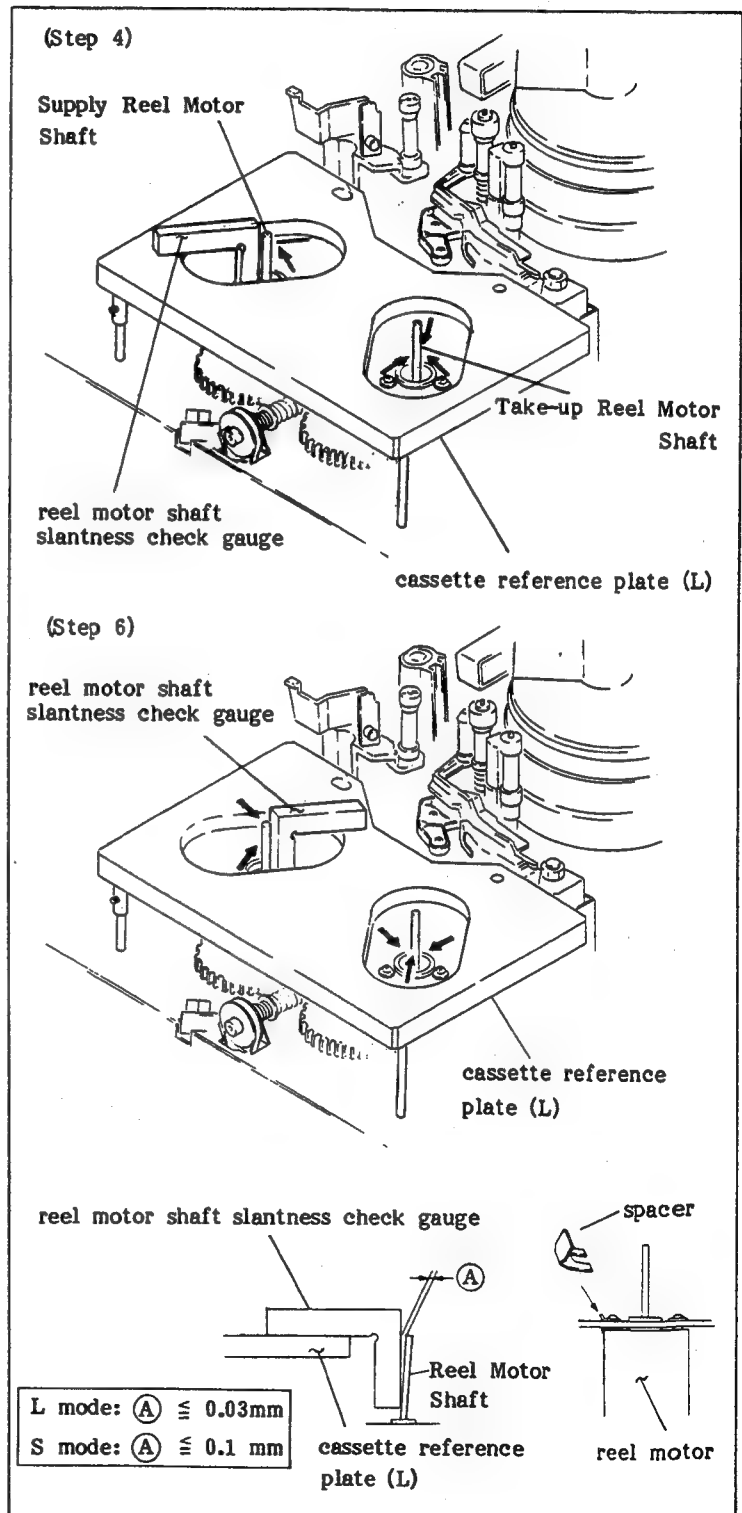
**Mode:** Unthreading end mode

**Check procedure:**

- (1) Put the Reel Block into the L mode.
- (2) Remove the Reel Table as described in replacement procedures (1) to (4) of Section 5-2, Replacement of the Reel Table. (Be careful not to lose the reel table height adjustment poly-slider washer.)
- (3) Install the cassette reference plate (L) at the position for the cassette.
- (4) Check that the clearance between the check gauge and the shaft meets the required specification, when the reel motor shaft slantness check gauge is set on the reel motor shaft from three directions as shown in the figure.
- (5) Put the Reel Block into the S mode.
- (6) Perform as described in procedure (4) again.

**Adjustment procedure:**

- (1) Insert the reel motor spacer at the reel motor mounting screw as shown in the figure.
  - . **Reel motor spacer:**  
3-717-625-01
- (2) After adjustment, install the Reel Table and perform Section 6-1-4, Reel Table Height Adjustment.



#### 6-1-4. Reel Table Height Adjustment

- . This adjustment is usually not required. Proceed with the following steps when the Reel Motor or Reel Table is replaced.
- . Adjust the Supply Reel Table so that its position is 0.25 mm higher than the position adjusted by the reel table height gauge. Proper tape transport can be then obtained.

**Tool:** Cassette reference plate (L)  
Reel table height gauge  
Hex. key (across flat has 1.5 mm)

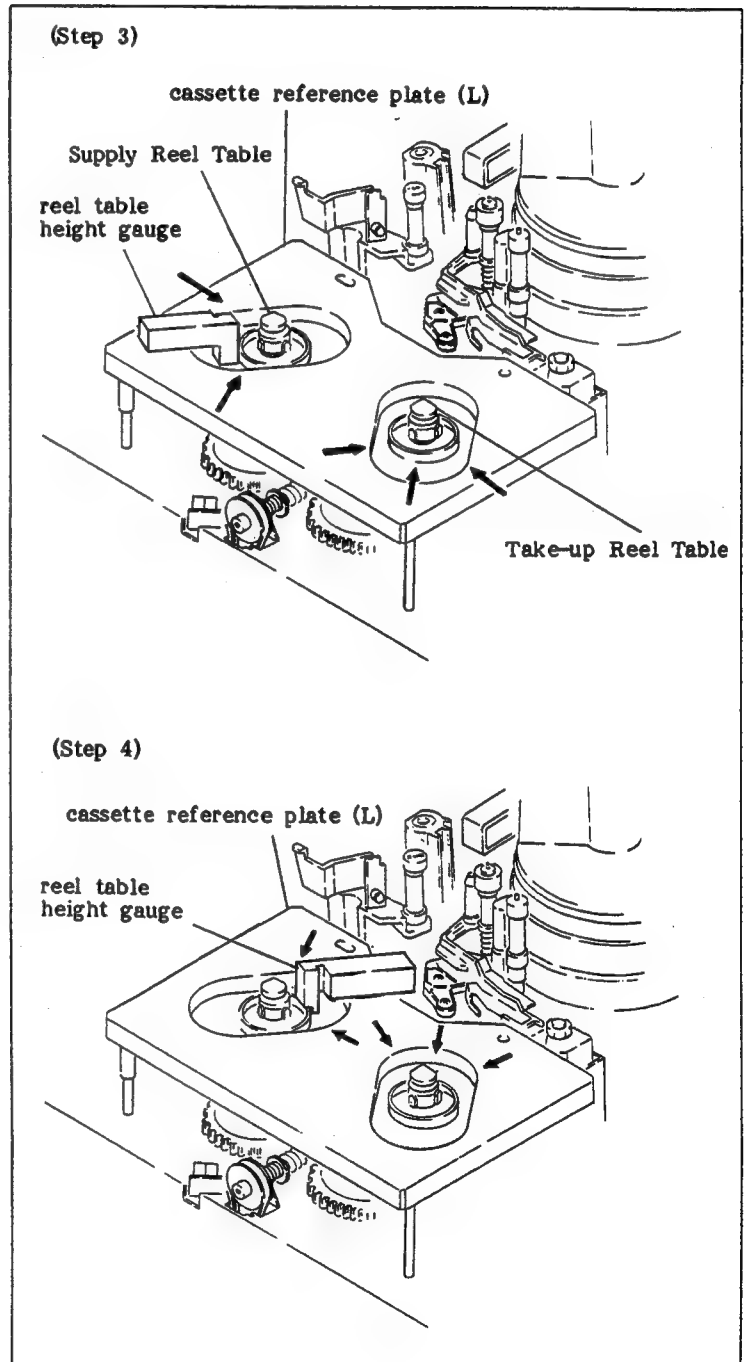
**Mode:** Unthreading end mode

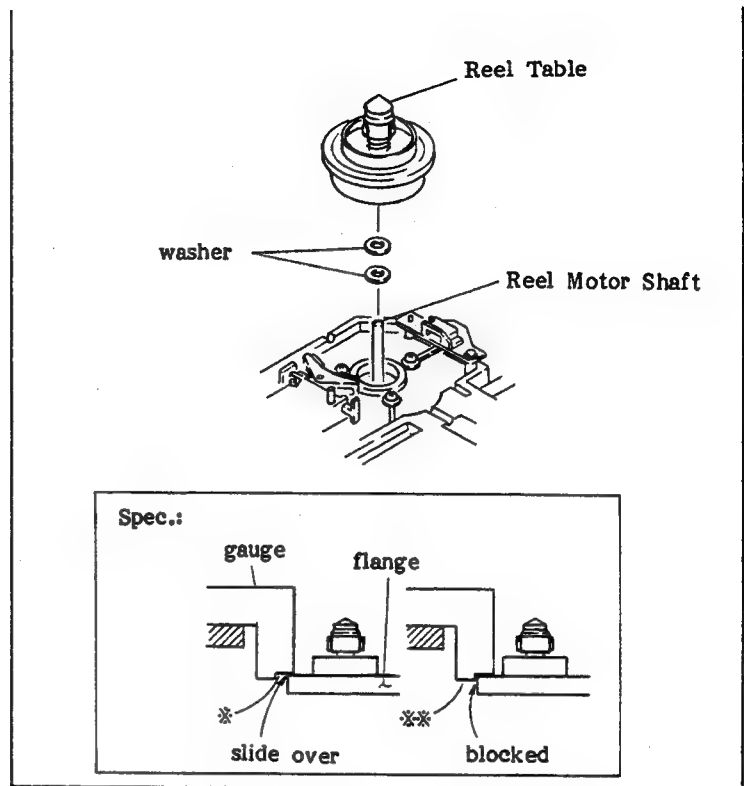
##### Adjustment procedure:

- (1) Put the Reel Block into the L mode.
- (2) Install the cassette reference plate (L) at the position for the cassette.
- (3) Move the reel table height gauge from three directions as shown in the figure. Adjust the height by changing the number of washers under the reel table so that the \* marked portion of the gauge can slide over the Reel Table, while the \*\* marked portion is against and cannot slide over the Reel Table.
- (4) Put the Reel Block into the S mode.
- (5) After procedures (3) and (4) are completed, insert a poly-slider washer (0.25 mm thick) under the Supply Reel Table.

##### . Adjustment washer:

poly-slider washer, 4 mm dia.  
0.13 mm thick    3-701-441-01  
0.25 mm thick    3-701-441-11  
0.5 mm thick     3-701-441-21





#### 6-1-5. Reel Table Rotation Detector Block Position Adjustment

**Tools:** Thickness gauge

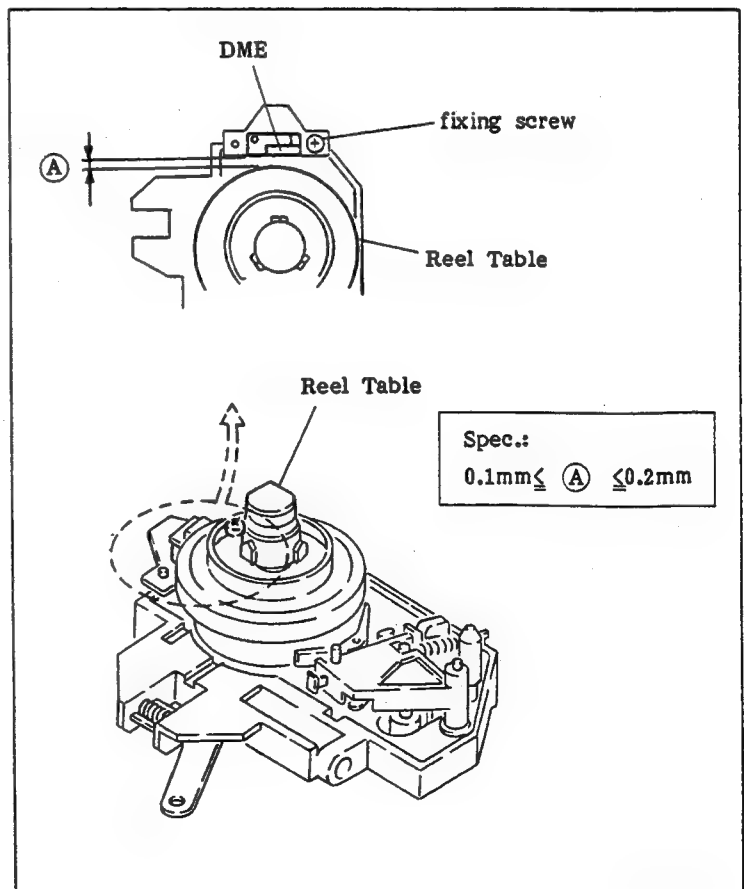
**Mode:** Unthreading end mode (L or S mode)

**Check procedure:**

- (1) Check that the clearance between the Take-up Reel Table/Supply Reel Table and the DME on the Reel Table Rotation Detector meets the required specification.

**Adjustment procedure:**

- (1) Loosen the fixing screw of the Take-up Reel Table Rotation Detector Block.
- (2) Adjust the position of the Reel Table Rotation Detector Block meets the required specification.
- (3) Adjust the position of the Supply Reel Table Rotation Detector Block in the same way.





## 6-2. BRAKE SYSTEM ADJUSTMENT

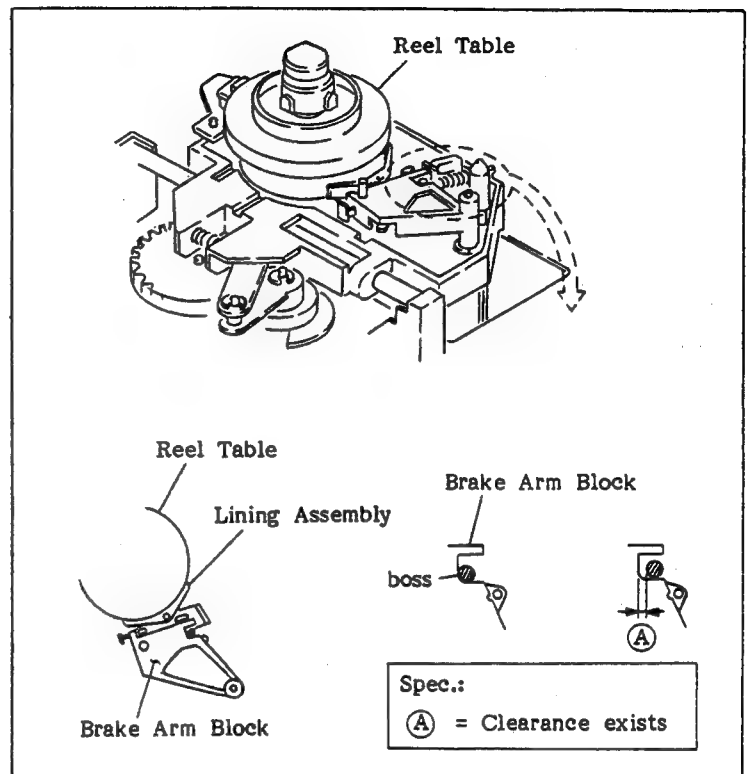
### 6-2-1. Reel Table Brake Clearance Adjustment

#### Check procedure:

- (1) When turning the Take-up Reel Table in the counterclockwise direction by hand, check that the clearance between the Brake Arm Block and the boss exists.
- (2) When turning the Supply Reel Table in the clockwise direction, check that the clearance between the Brake Arm Block and the boss exists.

#### Adjustment procedure:

- (1) Replace the Lining Ass'y as described in Section 5-6, Replacement of the Reel Table Brake.
- (2) Check it again.



### 6-2-2. Reel Table Brake Release Adjustment

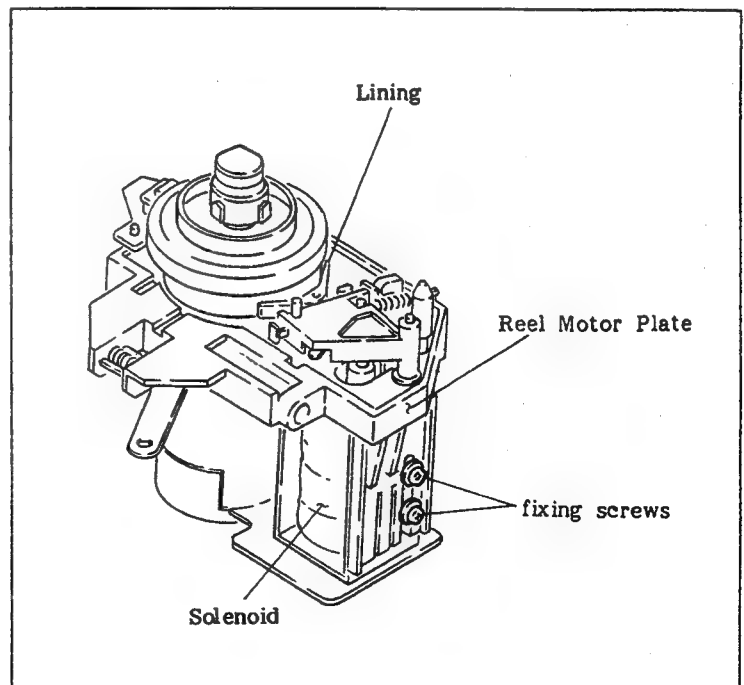
**Mode:** STOP mode (POWER ON)

#### Check procedure:

- (1) Check that the Take-up Reel Lining does not touch the Take-up Reel Table during Take-up Reel Table rotation.
- (2) Check that the Supply Reel Lining does not touch the Supply Reel Table during Supply Reel Table rotation.

#### Adjustment procedure:

- (1) Remove the Reel Motor Plate.
- (2) Loosen the fixing screws of the solenoid.
- (3) Lower the solenoid slight and secure it using the screws.
- (4) Confirm according to the check procedure.
- (5) Install the Reel Motor Plate and perform Section 6-1-2, Cassette Holder Height Adjustment (S); and 6-1-4, Reel Table Height Adjustment.



### 6-3. TENSION REGULATOR SYSTEM ADJUSTMENT

#### 6-3-1. Tension Regulator Arm Position Adjustment

. This adjustment is closely related to the video tracking adjustment and the tension regulator arm slantness adjustment.

After this adjustment, perform Section 8-1, Video Tracking Adjustment; and Section 6-3-2, Tension Regulator Arm Slantness Adjustment.

**Tool:** Tension scale (50 g full scale)

Wire clearance gauge

Locally-produced-tape

(Refer to "alignment information".)

**Mode:** Threading end mode without a cassette.

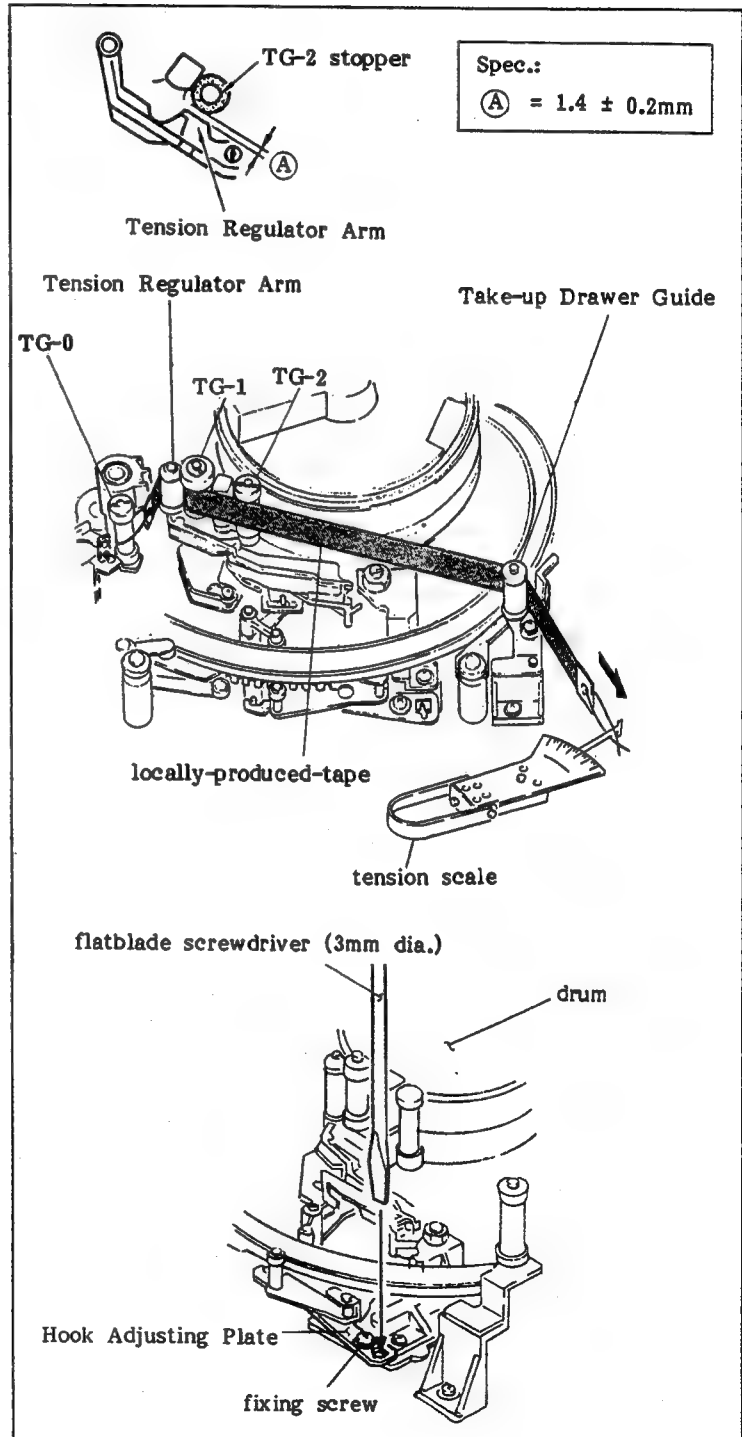
(Turn the power OFF.)

#### Check procedure:

- (1) Install the locally-produced-tape as shown in the figure.
- (2) Hook a tension scale to an end of the string. Pull out the tape in the direction of the arrow so that the scale reading is 45 g.
- (3) When the scale reading is 45 g, check that the clearance between the stopper of the Tape Guide (2) and the Tension Regulator Arm meets the required specification.

#### Adjustment procedure:

- (1) Loosen the fixing screw of the Hook Adjusting Plate 1/4 to 1/2 turn.
- (2) Insert a flatblade screwdriver (3 mm dia.) into the adjusting hole as shown in the figure, then adjust it to meet the required specification.
- (3) After adjustment, check as described in the check procedures.



### 6-3-2. Tension Regulator Arm Slantness Adjustment

- . This adjustment is closely related to the video tracking adjustment.
- . After this adjustment, perform Section 8-1, Video Tracking Adjustment.

**Tool:** Cassette reference plate (L)

Tension regulator slantness check tool

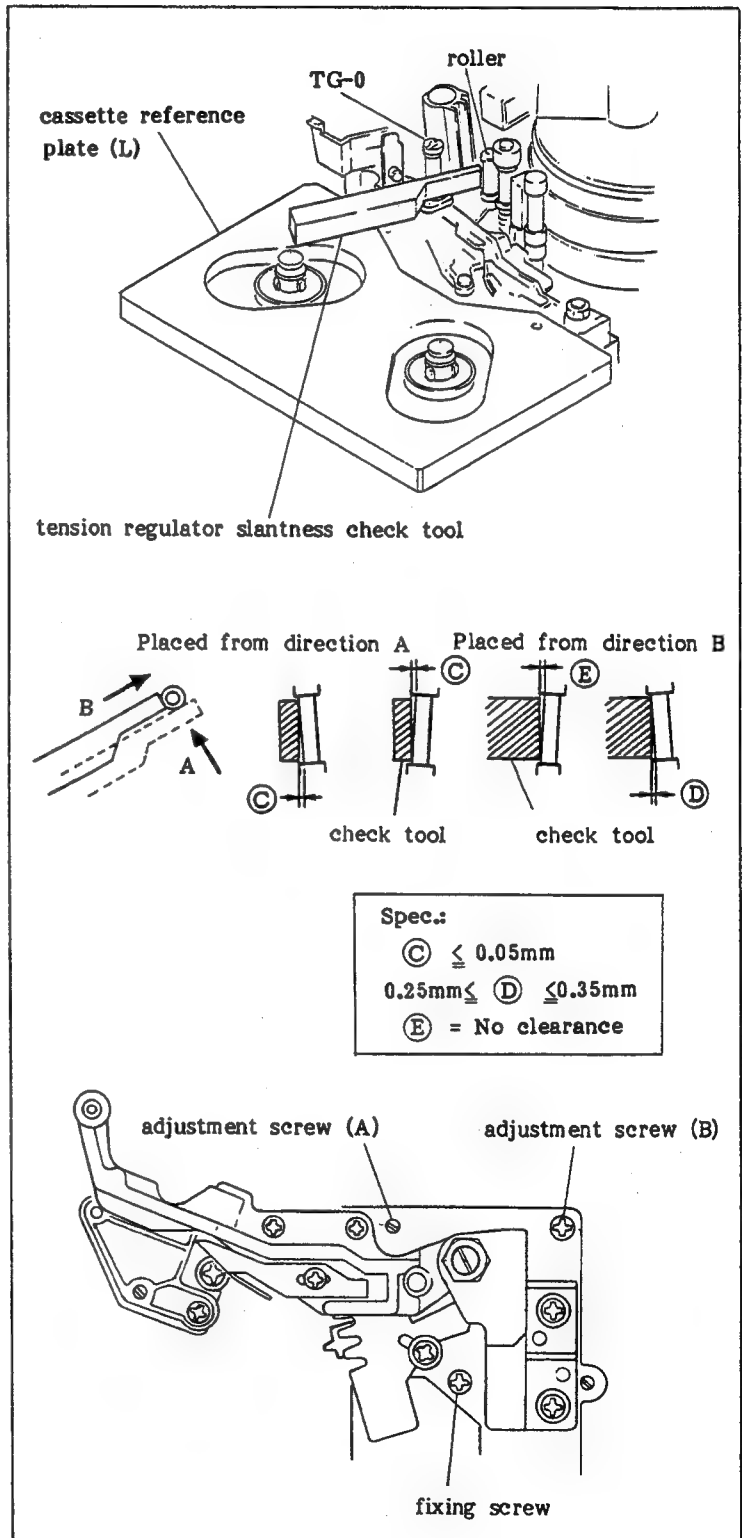
**Mode:** Threading end mode

**Check procedure:**

- (1) Install the cassette reference plate (L) into the cassette position.
- (2) Place the tension regulator slantness check tool against the Tension Regulator Roller. Check that the slantness of the roller meets the required specification viewed from the direction of arrows A and B as shown in the figure.

**Adjustment procedure:**

- . When the slantness is out of spec. (placed from the direction of arrow A).
- (1) Loosen the fixing screw 1/2 to 1 turn.
  - (2) Adjust the slantness with the adjustment screws (A) and (B).
  - (3) Tighten the fixing screw and check again.
  - (4) After adjustment, perform the Step (8).
- . When the slantness is out of spec. (placed from the direction of arrow B).
- (5) Loosen the fixing screw 1/2 to 1 turn.
  - (6) Adjust the slantness with the adjustment screw (B).
  - (7) Tighten the fixing screw and check again.
  - (8) After adjustment, perform Section 6-3-1, Tension Regulator Arm Position Adjustment; Section 8-1, Video Tracking Adjustment.



#### 6-4. THREADING RING ROTATION ADJUSTMENT

- . This adjustment is required only when the Threading Ring or Ring Roller (B) Ass'y is replaced or removed.

**Mode:** Turn the power OFF while rotating the Threading Ring 180 degrees from unthreading end state.

**Check procedure:**

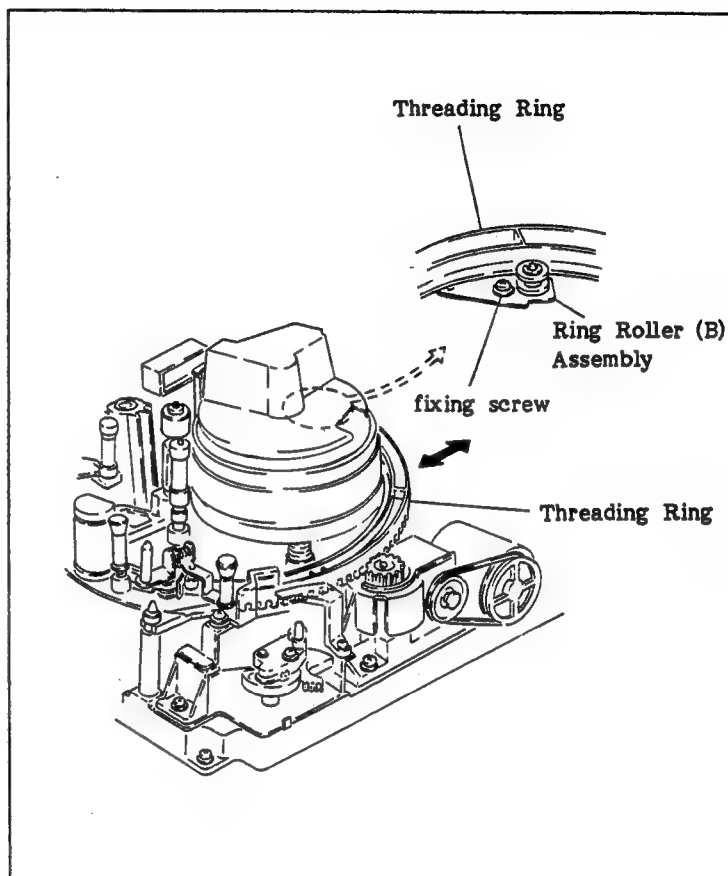
- (1) Check that the horizontal play meets the required specification when the Threading Ring is pushed in the direction of the arrow by hand.
- (2) Check that the rotation of the Threading Ring into the threading and unthreading modes is smooth.

**Adjustment procedure:**

- (1) Loosen the fixing screw of the Ring Roller (B) Ass'y 1/2 to 1 turn.
- (2) Adjust the position of the Ring Roller (B) Ass'y to meet the required specification.

**Adjusting procedure:**

- . Insert a 0.3 mm thick piece of paper between the Threading Ring and the Ring Roller.
- . The paper of this manual is about 0.1 mm thick so that three pages are 0.3 mm thick.



## 6-5. GEAR BOX POSITION ADJUSTMENT

. It is required that Section 6-4, Threading Ring Rotation Adjustment is correct before initiating this adjustment.

**Tool:** Wire clearance gauge

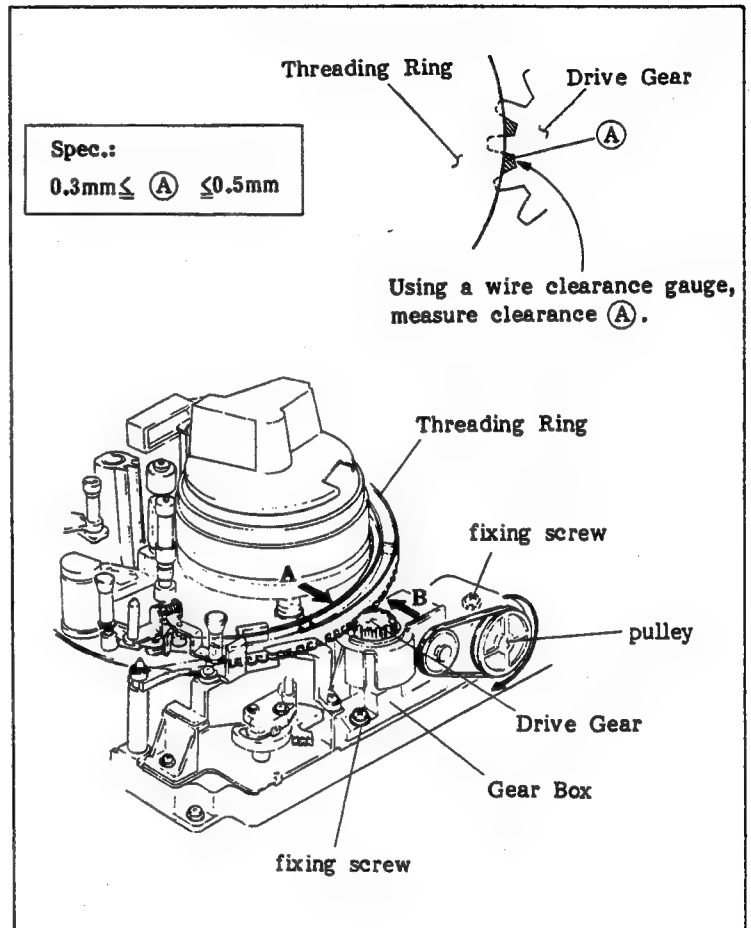
**Mode:** Unthreading end mode

**Check procedure:**

- (1) Turn the pulley of the Gear Box by hand about 90 degrees in the direction of the arrow.
- (2) When pushing the Threading Ring in the direction of arrow (B) by hand, check that the clearance between the Threading Ring and the Drive Gear of the Gear Box meets the required specification with the wire clearance gauge.

**Adjustment procedure:**

- (1) Loosen the fixing screws of the Gear Box 1 to 2 turns.
- (2) Press the Threading Ring in the direction of arrow (A), while lightly pushing the Drive Gear of the Gear Box against the Threading Ring.
- (3) Tighten the fixing screws of the Gear Box.
- (4) After adjustment, check as described in the check procedures.



## 6-6. PINCH ROLLER PRESS BLOCK POSITION ADJUSTMENT

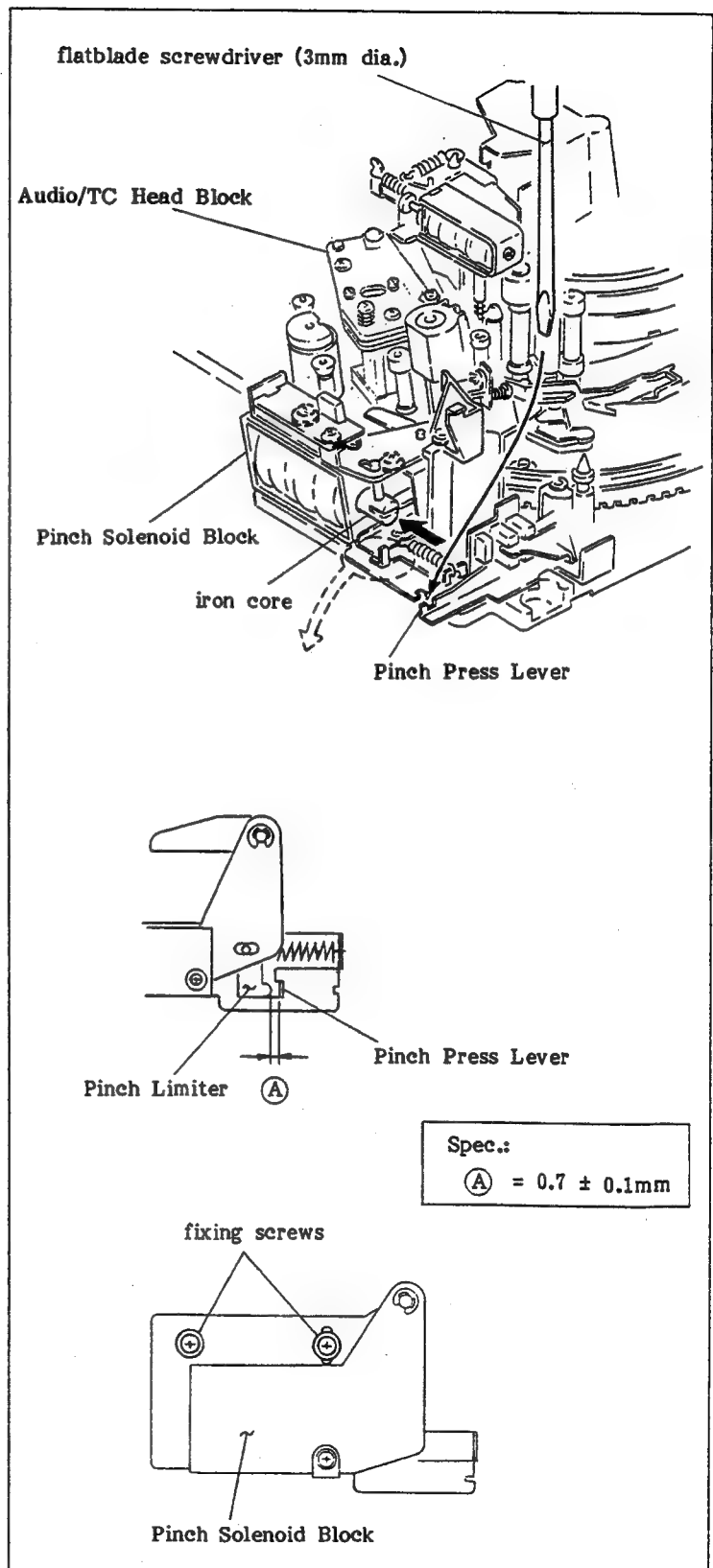
Mode: Threading end mode

### Check procedure:

- (1) Move the iron core of the Pinch Solenoid to the fully energized position in the direction of the arrow.
- (2) Check that the clearance between the Pinch Press Lever and the Pinch Limiter meets the required specification.

### Adjustment procedure:

- (1) Loosen the two fixing screws of the Pinch Solenoid Block 1/4 to 1/2 turn.
- (2) Insert a flatblade screwdriver (3 mm dia.) into the adjusting hole of the Pinch Solenoid Block, then adjust the position of the Pinch Solenoid Block to meet the required specification.
- (3) Tighten the two fixing screws, check as described in the check procedures.



## 6-7. TENSION SENSOR POSITION ADJUSTMENT

**Tool:** Digital multimeter

Tension scale (50 g full scale)

Locally-produced-tape

(Refer to "alignment information".)

**Mode:** STANDBY OFF mode without a cassette tape

### Preparation:

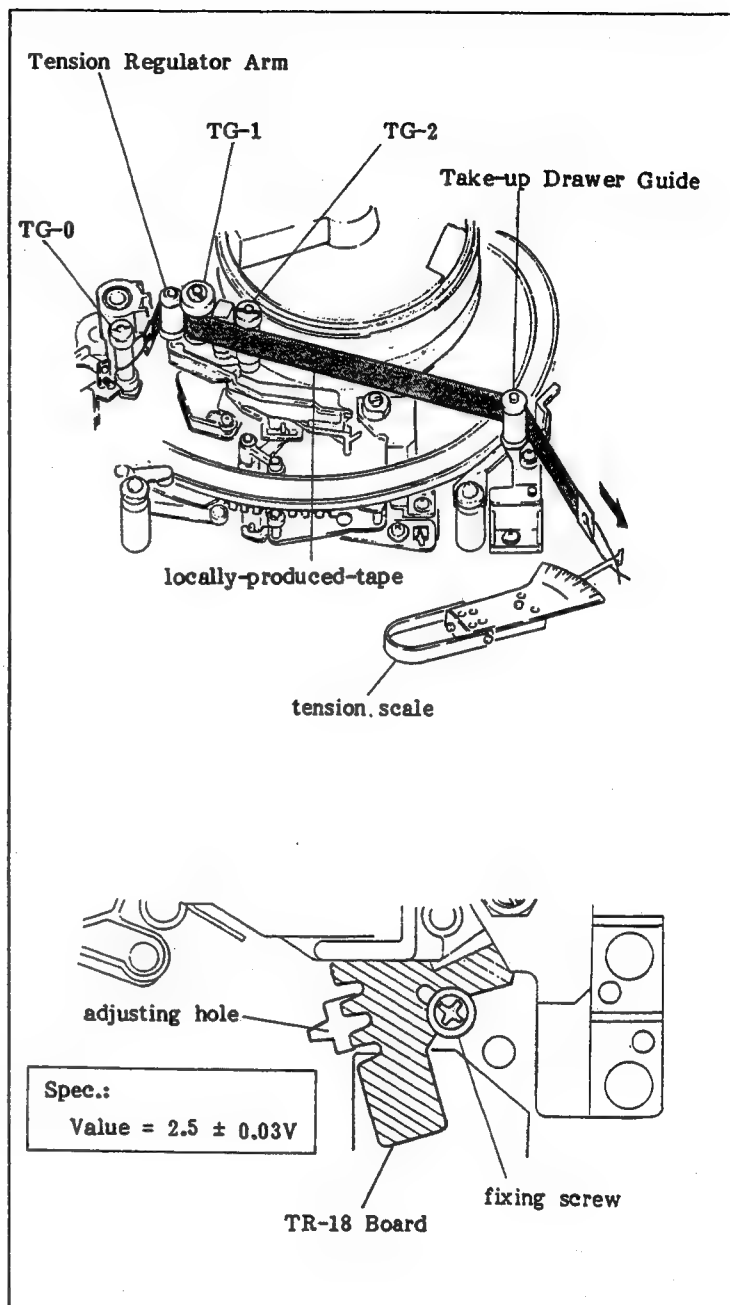
- (1) Extend the SV-83B Board with an Extension Board.
- (2) Connect the digital multimeter to TP3 on the SV-83B Board.

### Check procedure:

- (1) Install the locally-produced-tape as shown in the figure.
- (2) Hook a tension scale to an end of the string. Pull the tape in the direction of the arrow so that scale reading is 45 g.
- (3) When the scale reading is 45 g, check that the reading of the digital multimeter meets the required specification.

### Adjustment procedure:

- (1) Loosen the fixing screw of the TR-18 Board about 1/4 to 1/2 turn.
- (2) Insert a flatblade screwdriver (3 mm dia.) into the adjustment hole, then adjust the position of the TR-18 Board to meet the required specification.
- (3) Tighten the fixing screw, check that it meets the required specification again.
- (4) After adjustment, perform Section 6-8, Tension Sensor Sensitivity Adjustment.



## 6-8. TENSION SENSOR SENSITIVITY ADJUSTMENT

- . It is required that Section 6-7, Tension Sensor Position Adjustment is correct before initiating this adjustment.

**Tool:** Digital multimeter

Tension scale (50 g full scale)

Locally-produced-tape

(Refer to "alignment information".)

**Mode:** STANDBY OFF mode without a cassette tape

### Preparation:

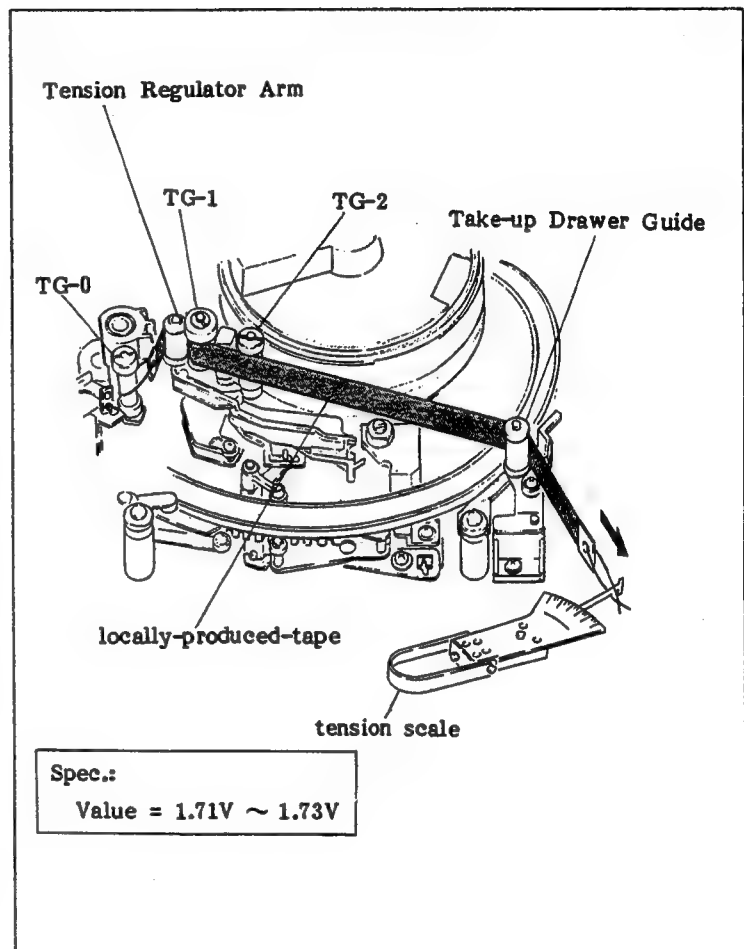
- (1) Extend the SV-83B Board with an Extension Board.
- (2) Connect the digital multimeter to TP3 on the SV-83B Board.

### Check procedure:

- (1) Install a locally-produced-tape as shown in the figure.
- (2) Hook a tension scale to an end of the string. Pull the tape in the direction of the arrow so that scale reading is 25 g.
- (3) When the scale reading is 25 g, check that the reading of the digital multimeter meets the required specification.

### Adjustment procedure:

- (1) Adjust RV3 on the SV-83B Board to meet the required specification.
- (2) After adjustment, check that it meets the required specification again.





## 6-9. CLEANING ROLLER POSITION ADJUSTMENT

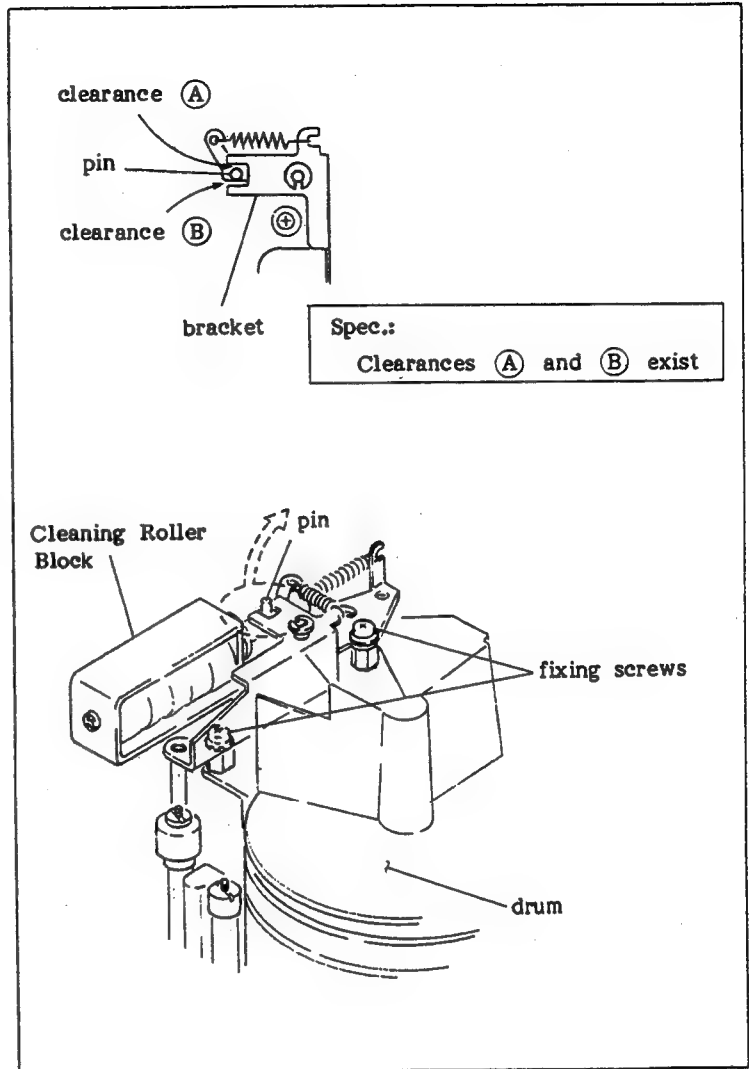
**Mode:** Unthreading end mode

### Check procedure:

- (1) Turn the power ON, short between TP-1 on the PD-35 Board and the chassis with a shorting clip.
- (2) Check that the clearance between the Cleaning Roller Block Pin and the bracket meets the required specification.
- (3) Insert the cassette tape in F.FWD mode. Check that the clearance between the pin and the bracket meets the required specification.
- (4) If the specification is met, remove the shorting clip. (If the shorting clip is shorting for a long time, the internal fuse of the Cleaning Roller Solenoid will be blown.)

### Adjustment procedure:

- (1) Loosen the two fixing screws of the Cleaning Roller Block and adjust the position to meet the required specification as described in procedure (1).
- (2) Check as described in the check procedure (3).
- (3) Remove the shorting clip.





## SECTION 7

### TORQUE ALIGNMENT

#### ALIGNMENT INFORMATION

##### MODES

##### Unthreading end mode

This indicates the EJECT completion mode. At the time of ejection, the tension regulator arm and threading ring are completely returned to the cassette tape side.

##### Threading mode

When the STOP button is pressed, the threading ring rotates counterclockwise.

##### Threading end mode (STOP mode)

When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is then stopped.

##### PLAY mode without a cassette tape

- (1) Remove the Cassette-up Compartment (refer to Section 4-2).
- (2) Set DIP switch S106 on the SY-61A Board to ON.
- (3) Set System Setup \*Item 902 to 1.  
(At that time, message "Error" appears on the time counter display of the front panel. The unit is activated normally irrespective of its message.)
- (4) When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is stopped. The STANDBY lamp then lights, and the unit enters the STOP mode.
- (5) When the PLAY button is pressed, the pinch roller is pressed against the capstan shaft, and the unit enters the PLAY mode.
- (6) After adjustment is completed, set System Setup \*Item 902 to 0.
- (7) Set DIP switch S106 on the SY-61A Board to OFF.
- (8) Install the Cassette-up Compartment.

##### STANDBY OFF mode without a cassette tape

- (1) Put the unit into the STOP mode without a cassette tape (refer to Steps 1 through 4 described above).
- (2) Press the STANDBY button after the STANDBY lamp lights.  
The STANDBY lamp then goes off, and the unit enters the STANDBY OFF mode in which the drum rotation is stopped.
- (3) After adjustment is completed, set System Setup \*Item 902 to 0.
- (4) Set DIP switch S106 on the SY-61A Board to OFF.
- (5) Install the Cassette-up Compartment.

**REV mode without a cassette tape**

- (1) Put the set into the STOP mode without a cassette tape.
- (2) Turn the search dial counterclockwise. The unit then enters the REV mode.
- (3) After adjustment is completed, set System Setup \*Item 902 to 0.
- (4) Set DIP switch S106 on the SY-61A Board to OFF.
- (5) Install the Cassette-up Compartment.

**\* Item 902**

For setting, refer to the Setup in 1-7-1. To display this item, turn the SEARCH dial while pressing the PLAY button.

Note: Item 900 series are used only at the factory. Setting should not be thus changed.  
When setting is changed, be sure to return it to the initial value.

## 7-1. BRAKE TORQUE CHECK

### 7-1-1. S Brake Torque Check

**Tool:** Reel table tension gauge  
Tension scale (100 g full scale)

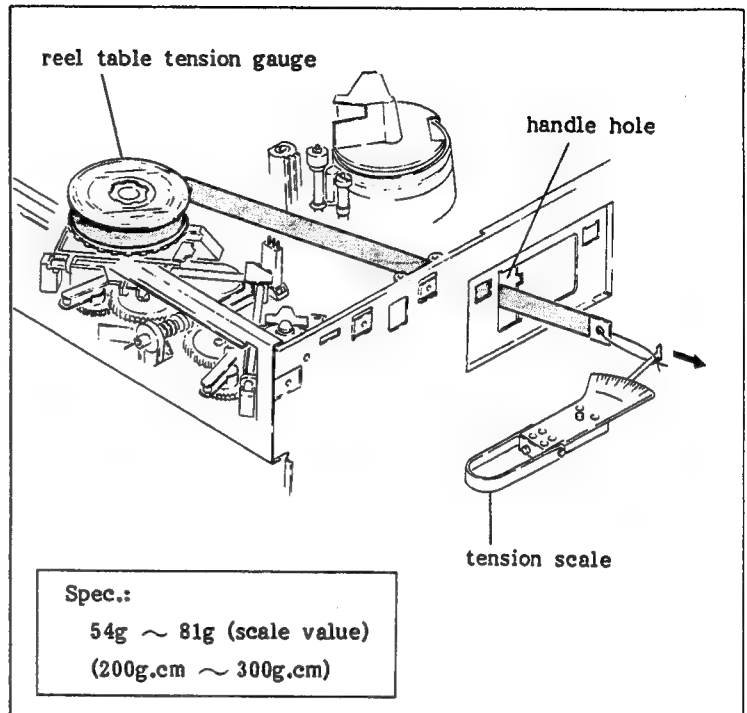
**Mode:** Threading end mode

**Preparation:**

- (1) Remove the handle on the right side.
- (2) Remove the Tape Beginning Sensor.

**Check procedure:**

- (1) Wind the tape to the reel table tension gauge in the clockwise direction.
- (2) Install the reel table tension gauge on the Supply Reel Table. Pass the end of the tape out for the unit from the hole of the handle.
- (3) Hook a tension scale to an end of the string. Move the tension scale in the direction of the arrow, check that the scale reading meets the required specification.



### 7-1-2. T Brake Torque Check

**Tool:** Reel table tension gauge  
Tension scale (100 g full scale)

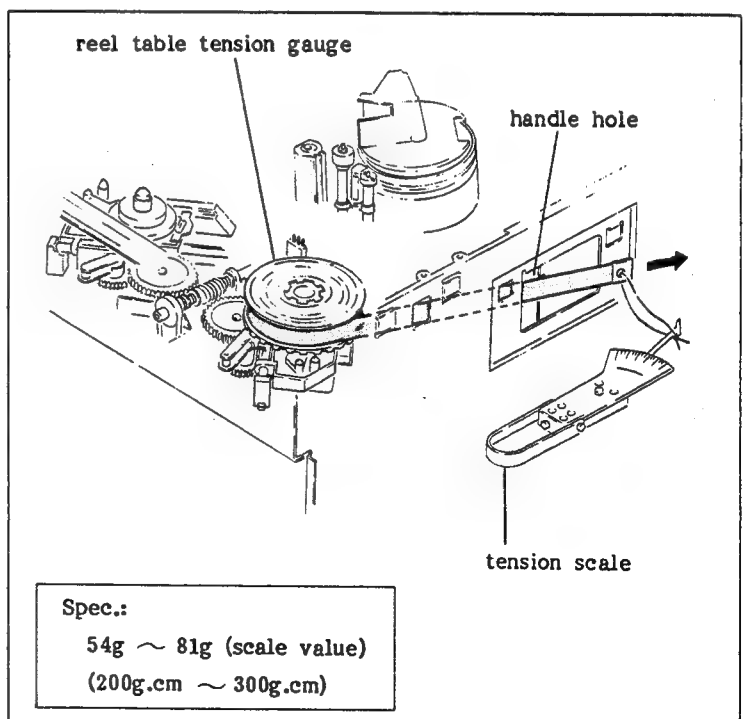
**Mode:** Threading end mode

**Preparation:**

- (1) Remove the handle on the right side.
- (2) Remove the Tape Beginning Sensor.

**Check procedure:**

- (1) Wind the tape to the reel table tension gauge in the counterclockwise direction.
- (2) Install the reel table tension gauge on the Take-up Reel Table. Pass the end of the tape out for the unit from the hole of the handle.
- (3) Hook a tension scale to an end of the string. Move the tension scale in the direction of the arrow, check that the scale reading meets the required specification.



## 7-2. REEL TORQUE ADJUSTMENT

### 7-2-1. Reel Zero Gram Torque Adjustment

- . After this adjustment, perform the Section  
7-2-2 Reel 250 Gram Torque Adjustment.

**Tool:** Oscilloscope

**Mode:** Threading end mode

**Preparation:**

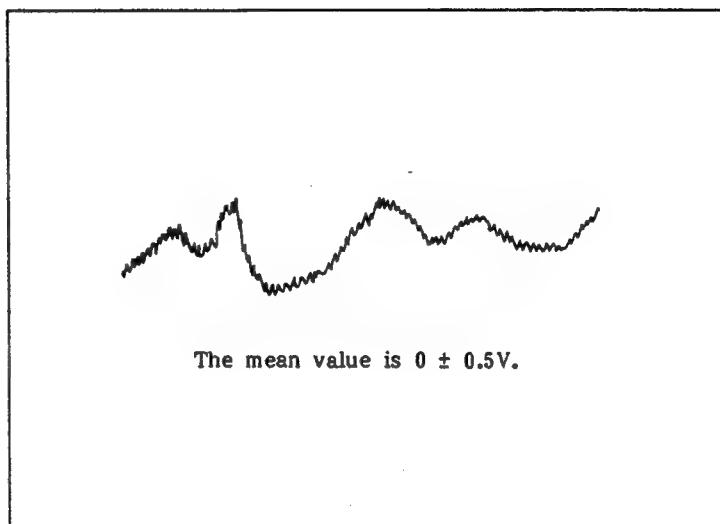
- (1) Set DIP switch S101-Bit 1 on the SV-82A Board to ON.
- (2) Without inserting a cassette tape, press the STOP button. Then the unit is put into the threading mode.
- (3) Short between TP4 on the SV-82A Board and GND with a shorting clip.
- (4) Connect the oscilloscope to TP13 on the SV-83B Board.

**Check procedure:**

- (1) Check that the voltage at TP13 meets the required specification.
- (2) Connect the oscilloscope to TP14 on the SV-83B Board.
- (3) Check that the voltage at TP14 meets the required specification.
- (4) Perform Steps (3) and (4) of the adjustment procedure so that the voltages at TP13 and TP14 meet the both specifications.

**Adjustment procedure:**

- (1) Adjust RV15 on the SV-83B Board to meet the required specification at TP13.
- (2) Adjust RV16 on the SV-83B Board to meet the required specification at TP14.
- (3) Remove the shorting clip between TP4 and GND. Press the EJECT button, then the unit is put into the unthreading mode.
- (4) Set DIP switch S101-Bit 1 to OFF.



## 7-1. BRAKE TORQUE CHECK

### 7-1-1. S Brake Torque Check

**Tool:** Reel table tension gauge  
Tension scale (100 g full scale)

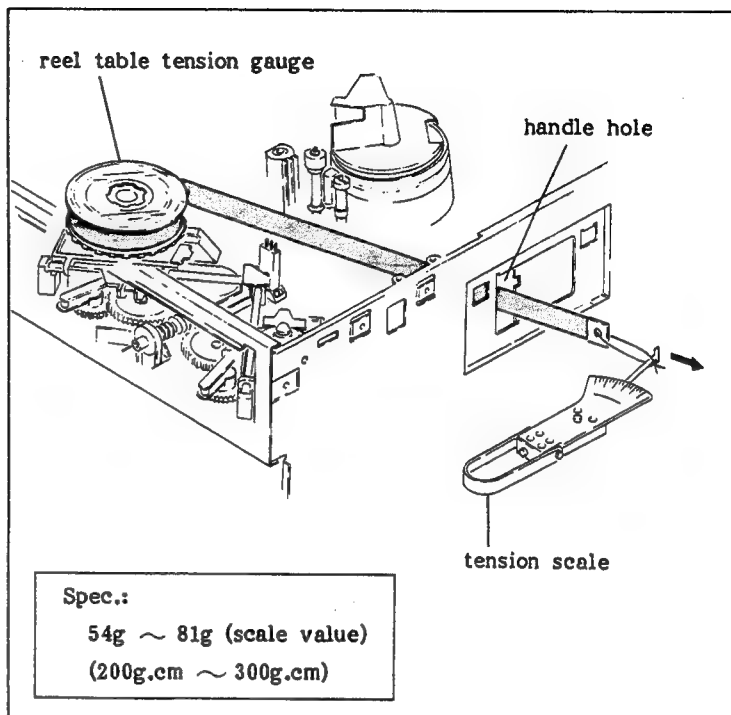
**Mode:** Threading end mode

**Preparation:**

- (1) Remove the handle on the right side.
- (2) Remove the Tape Beginning Sensor.

**Check procedure:**

- (1) Wind the tape to the reel table tension gauge in the clockwise direction.
- (2) Install the reel table tension gauge on the Supply Reel Table. Pass the end of the tape out for the unit from the hole of the handle.
- (3) Hook a tension scale to an end of the string. Move the tension scale in the direction of the arrow, check that the scale reading meets the required specification.



### 7-1-2. T Brake Torque Check

**Tool:** Reel table tension gauge  
Tension scale (100 g full scale)

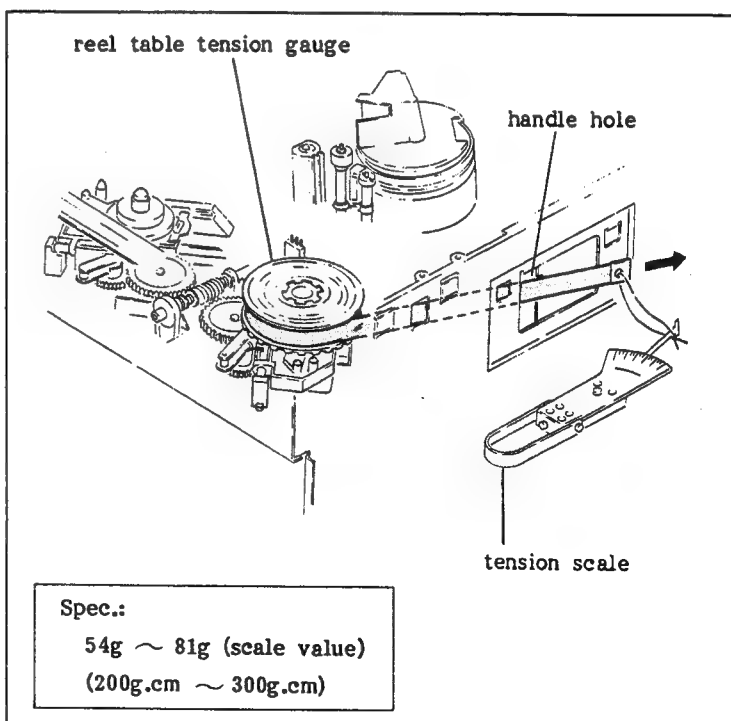
**Mode:** Threading end mode

**Preparation:**

- (1) Remove the handle on the right side.
- (2) Remove the Tape Beginning Sensor.

**Check procedure:**

- (1) Wind the tape to the reel table tension gauge in the counterclockwise direction.
- (2) Install the reel table tension gauge on the Take-up Reel Table. Pass the end of the tape out for the unit from the hole of the handle.
- (3) Hook a tension scale to an end of the string. Move the tension scale in the direction of the arrow, check that the scale reading meets the required specification.



## 7-2. REEL TORQUE ADJUSTMENT

### 7-2-1. Reel Zero Gram Torque Adjustment

- . After this adjustment, perform the Section  
7-2-2 Reel 250 Gram Torque Adjustment.

**Tool:** Oscilloscope

**Mode:** Threading end mode

**Preparation:**

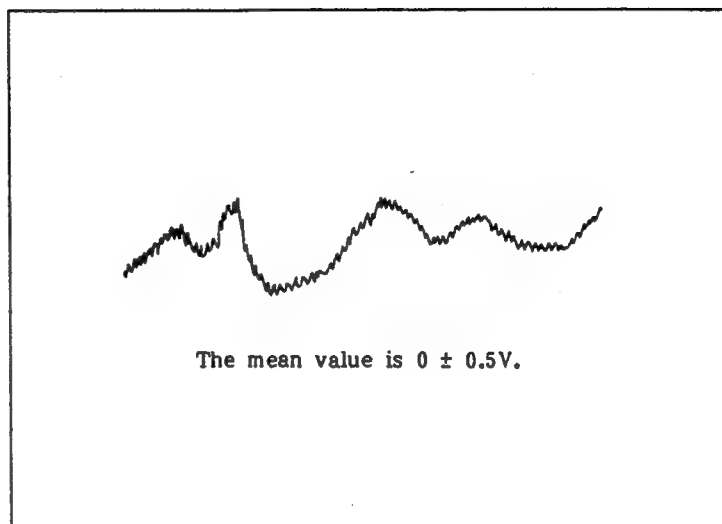
- (1) Set DIP switch S101-Bit 1 on the SV-82A Board to ON.
- (2) Without inserting a cassette tape, press the STOP button. Then the unit is put into the threading mode.
- (3) Short between TP4 on the SV-82A Board and GND with a shorting clip.
- (4) Connect the oscilloscope to TP13 on the SV-83B Board.

**Check procedure:**

- (1) Check that the voltage at TP13 meets the required specification.
- (2) Connect the oscilloscope to TP14 on the SV-83B Board.
- (3) Check that the voltage at TP14 meets the required specification.
- (4) Perform Steps (3) and (4) of the adjustment procedure so that the voltages at TP13 and TP14 meet the both specifications.

**Adjustment procedure:**

- (1) Adjust RV15 on the SV-83B Board to meet the required specification at TP13.
- (2) Adjust RV16 on the SV-83B Board to meet the required specification at TP14.
- (3) Remove the shorting clip between TP4 and GND. Press the EJECT button, then the unit is put into the unthreading mode.
- (4) Set DIP switch S101-Bit 1 to OFF.





## 7-2-2. Reel 250 Gram Torque Adjustment

. It is required that Section 7-2-1 Reel Zero Gram Torque Adjustment is correct before initiating this adjustment.

**Tool:** Reel table tension gauge  
Tension scale (100 g full scale)

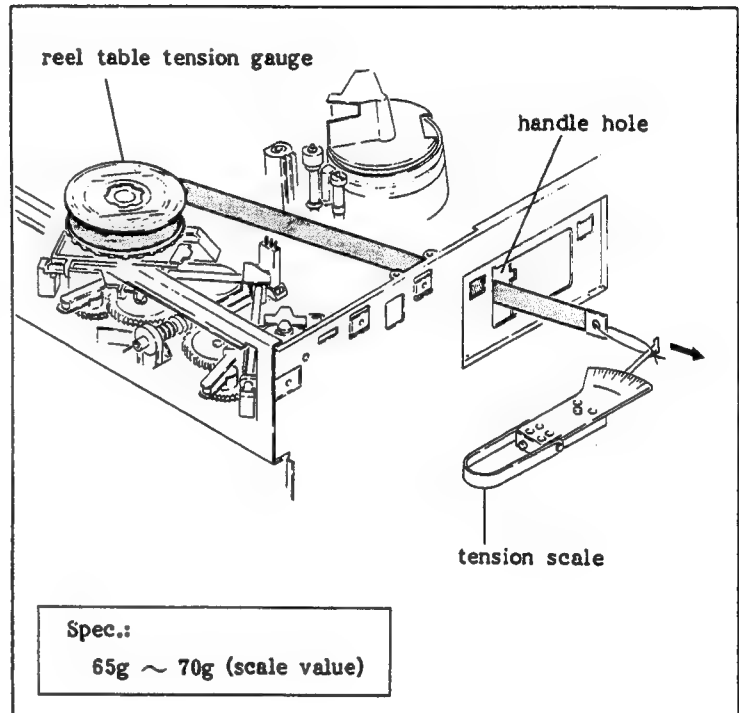
**Mode:** Threading end mode

### Preparation:

- (1) Remove the handle on the right side.
- (2) Remove the tape beginning sensor.
- (3) Set DIP switch S101-Bit 1 on the SV-82A Board to ON.
- (4) Without inserting a cassette tape, press the STOP button. The unit is then put into the threading mode.
- (5) Short between TP4 on the SV-82A Board and GND with a shorting clip.
- (6) Set DIP switch S101-Bit 1 on the SV-82A Board to OFF.

### Check procedure:

- (1) Wind the tape to the reel table tension gauge in the clockwise direction.
- (2) Stop the rotation of the Supply Reel Table by hand and install the reel table tension gauge on the Supply Reel Table. Pass the end of the tape out for the unit from the hole of the handle.
- (3) Hook a tension scale to an end of the string. Move the tension scale in the direction of the arrow and check that the scale reading is 65 to 70g.
- (4) Remove the reel table tension gauge from the Supply Reel Table and wind the tape to the reel table tension gauge in the counterclockwise direction.
- (5) Stop the rotation of the Take-up Reel Table by hand and install the reel table tension gauge on the Take-up Reel Table. Pass the end of the tape out for the unit from the hole of the handle.
- (6) Hook a tension scale to an end of the string. Move the tension scale in the direction of the arrow and check that the scale reading is 65 to 70g.



- (7) Perform Steps (3) and (4) of the adjustment procedure so that scale readings meet the both specifications.

**Adjustment procedure:**

- (1) Adjust RV4 on the SV-83B Board to meet the required specification at supply side.
- (2) Adjust RV13 on the SV-83B Board to meet the required specification at take-up side.
- (3) Set DIP switch S101-Bit 1 on the SV-82A Board to ON and remove the shorting clip between TP4 and GND.
- (4) Press the EJECT button. The unit is then put into the unthreading mode. After the unthreading is completed, set DIP switch S101-Bit 1 on the SV-82A Board to OFF.

## SECTION 8

### TAPE RUN ALIGNMENT

#### ALIGNMENT INFORMATION

#### MODES

##### Unthreading end mode

This indicates the EJECT completion mode. At the time of ejection, the tension regulator arm and threading ring are completely returned to the cassette tape side.

##### Threading mode

When the STOP button is pressed, the threading ring rotates counterclockwise.

##### Threading end mode (STOP mode)

When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is then stopped.

##### PLAY mode without a cassette tape

- (1) Remove the Cassette-up Compartment (refer to Section 4-2).
- (2) Set DIP switch S106 on the SY-61A Board to ON.
- (3) Set System Setup \*Item 902 to 1.  
(At that time, message "Error" appears on the time counter display of the front panel. The unit is activated normally irrespective of its message.)
- (4) When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is stopped. The STANDBY lamp then lights, and the unit enters the STOP mode.
- (5) When the PLAY button is pressed, the pinch roller is pressed against the capstan shaft, and the unit enters the PLAY mode.
- (6) After adjustment is completed, set System Setup \*Item 902 to 0.
- (7) Set DIP switch S106 on the SY-61A Board to OFF.
- (8) Install the Cassette-up Compartment.

##### STANDBY OFF mode without a cassette tape

- (1) Put the unit into the STOP mode without a cassette tape (refer to Steps 1 through 4 described above).
- (2) Press the STANDBY button after the STANDBY lamp lights.  
The STANDBY lamp then goes off, and the unit enters the STANDBY OFF mode in which the drum rotation is stopped.
- (3) After adjustment is completed, set System Setup \*Item 902 to 0.
- (4) Set DIP switch S106 on the SY-61A Board to OFF.
- (5) Install the Cassette-up Compartment.

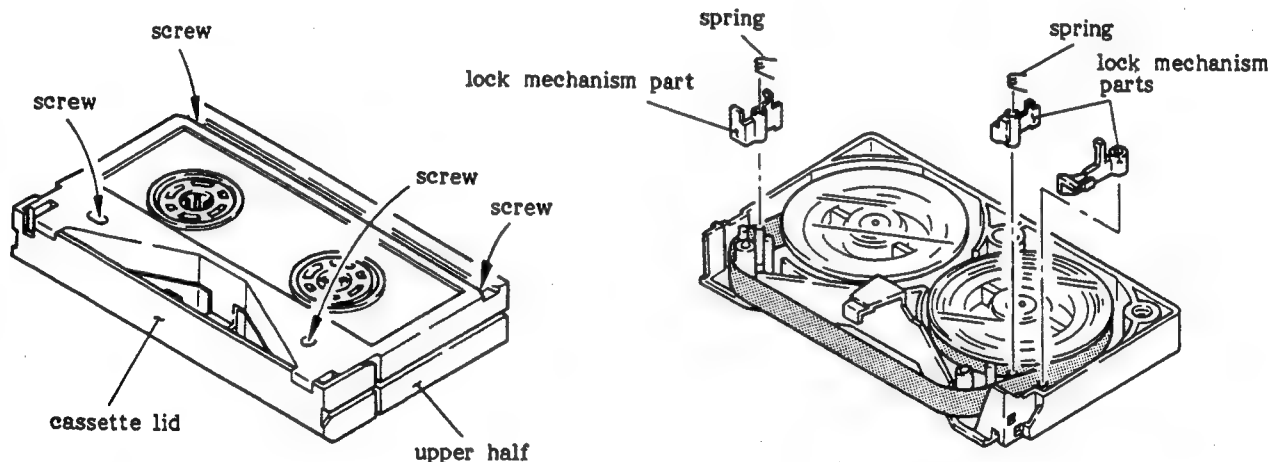
### REV mode without a cassette tape

- (1) Remove the Cassette-up Compartment (refer to 4-2).
- (2) Set DIP switch S106 on the SY-61A Board to ON.
- (3) Set System Setup \*Item 902 to 1.  
(At that time, message "Error" appears on the time counter display of the front panel. This unit is activated normally irrespective of its message.)
- (4) When the STOP button is pressed, the threading ring rotates counterclockwise, and the threading ring rotation is stopped. The STANDBY lamp then lights, and the unit enters the STOP mode.
- (5) Turn the search dial counterclockwise. The unit then enters the REV mode.
- (6) After adjustment is completed, set System Setup \*Item 902 to 0.
- (7) Set DIP switch S106 on the SY-61A Board to OFF.
- (8) Install the Cassette-up Compartment.

### Creating the Cassette Tape without Lid

Since the VTR is compact, some checks and adjustments cannot be performed if a cassette tape lid is installed. Remove the cassette tape lid as follows:

- (1) As shown in the figure, remove the four screws on the back of cassette tape BCT-20M and remove the upper half of the cassette tape.
- (2) Remove the lock mechanism parts and the springs on the left and right.
- (3) Remove the cassette lid from the upper half.
- (4) Install the upper half on the lower half with four screws from the back side.



### Creating the Alignment tape without Lid

Since the VTR is compact, tracking is difficult to adjust if an alignment tape is installed. Remove the lid of alignment tape CR2-1B PS for tracking adjustment. For removing, refer to the "Creating the Cassette Tape without Lid".

#### \* Item 902

For setting, refer to the Setup in 1-7-1. To display this item, turn the SEARCH dial while pressing the PLAY button.

Note: Item 900 series are used only at the factory. Setting should not be thus changed. When setting is changed, be sure to return it to the initial value.

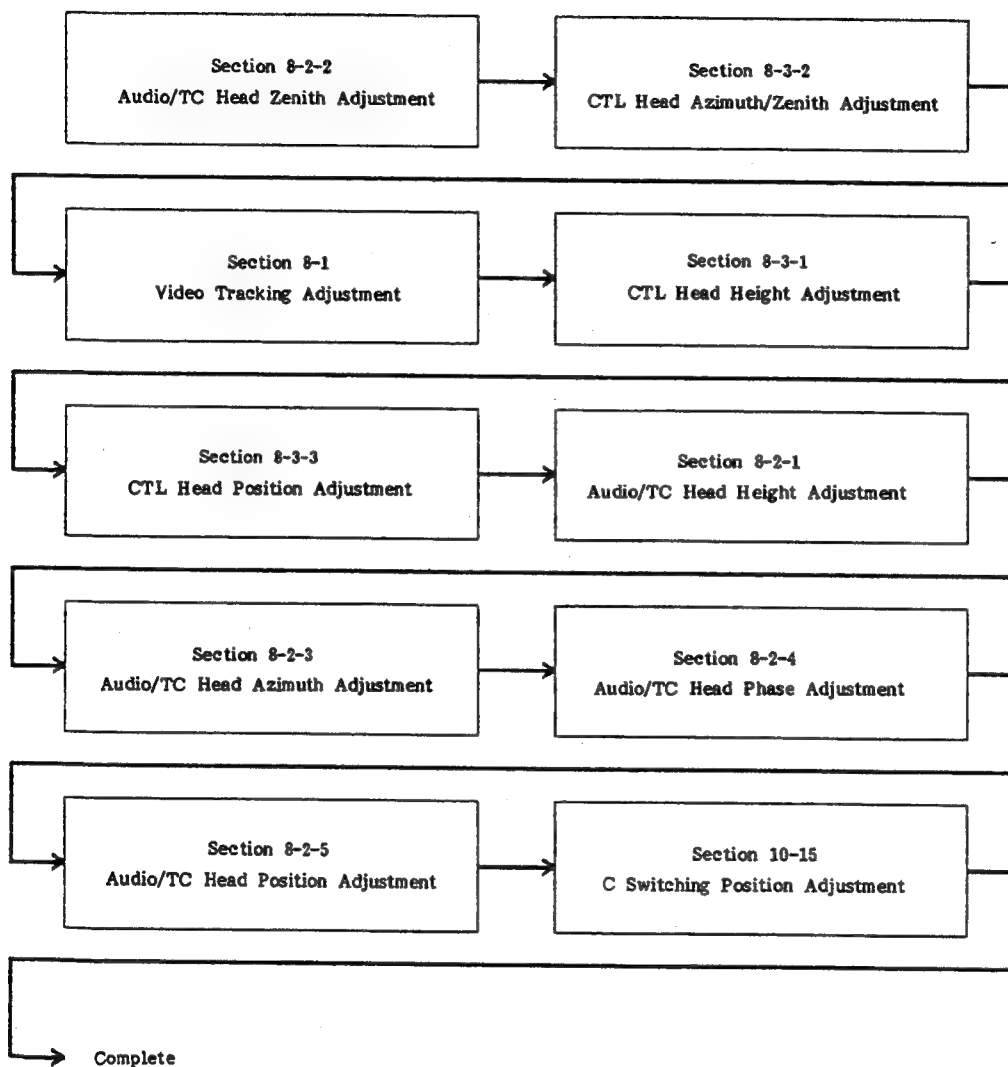
## **ALIGNMENT INFORMATION**

### **ALIGNMENT TAPE**

- . Alignment tape for tracking adjustment  
CR2-1B PS (8-960-096-51)
  
- . Alignment tape for general adjustment  
CR5-2A PS (8-960-098-44)  
CR5-1B PS (8-960-096-91)  
CR8-1B PS (8-960-096-86)

## TRACKING ADJUSTMENT

. The tracking adjustment is required to be performed in the following order:



## 8-1. VIDEO TRACKING ADJUSTMENT

**Tool:** Alignment tape, CR2-1B PS

Oscilloscope

Hex. key (across flat has 1.27 mm)

Inspection mirror

**Mode:** Play back the alignment tape

### Preparation:

- (1) Turn DIP switch S101-Bit4 on the SV-82A Board to "ON". (The phi-square servo circuit is off.)
- (2) Turn DIP switch S1 on the SV-83B Board to "ON". (The H-LOCK servo circuit is off.)
- (3) Remove the DM-56P Board. Extend it with an Extension Board.
- (4) Connect the oscilloscope as follows:  
CH-1: TP6/DM-56P Board  
EXT. TRIG: TP901/DM-56P Board
- (5) Play back the alignment tape.

### Check procedure:

- (1) Set S101-Bit2 on the SV-82A Board to "ON".
- (2) When RV102 on the SV-82A Board is turned, check that the RF waveform maintains a flat envelope while the amplitude increases and decreases.
- (3) Set S101-Bit2 on the SV-82A Board to "OFF" and check that the RF envelope fluctuation and head-to-tape contact are within the specification.
- (4) Check that the tape curls at the Tension Regulator, TG-1, TG-2, TG-3, and the Tape Threading Guide meets the required specification. (Refer to the adjustment procedure for specification.)
- (5) Check that the RF envelope head-to-tape contact is within the specification in the about REV x 1 mode.

### Adjustment procedure:

- When adjust the tape guide height.  
Loosen the setscrews of each tape guide in upper portion. and adjust with the adjusting nut.

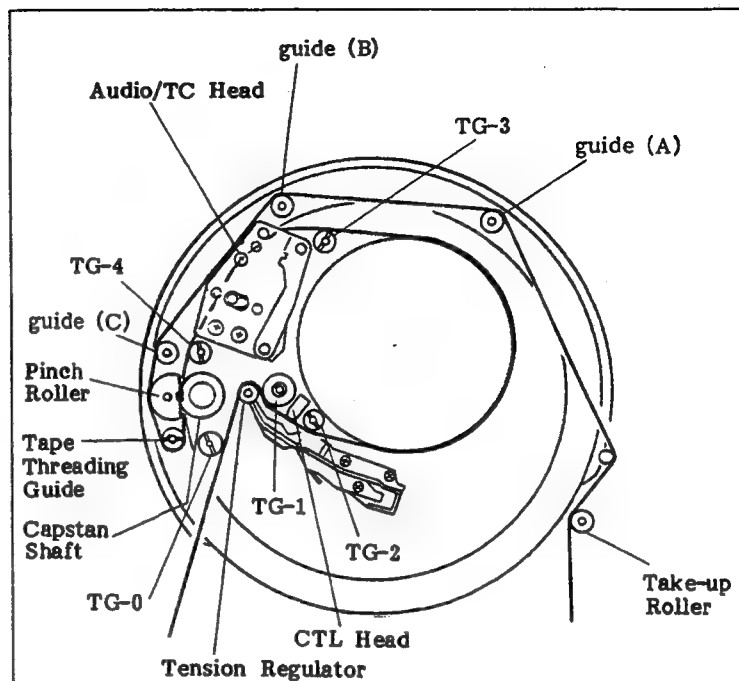
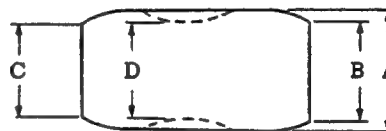


Fig. 1



### spec:

#### • During FWD

Head contact  $\frac{C}{A} \geq 0.8$

$\frac{B}{A} \geq 0.8$

Head contact fluctuation

$\frac{D}{A} \geq 0.9$

#### • During REV

Head contact  $\frac{C}{A} \geq 0.6$

$\frac{B}{A} \geq 0.6$

. When the tracking at the drum entrance side is not good.

- (1) Turn the adjusting nuts of TG-1 and TG-2. Make clearances at (a) and (b) of TG-1 and (a) and (b) of TG-2 as shown in figure 2.
- (2) Turn the adjusting nut of the Tension Regulator so that the RF waveform envelope changes from state (i) to state (ii) as shown in Fig. 3. Check that the tape runs in contact with the guide flange at the (a) portion of the Tension Regulator. If not, turn adjustment screw (b) of the Tension Regulator in counter-clockwise direction as shown in Fig. 4.
- (3) Turn the adjusting nut of TG-2 so that the tape runs in contact with the guide flange at the (b) portion of TG-2 and the RF waveform envelope flattens. Check that the tape does not in contact with the guide flange at the (b) portion of TG-1. The tape curl at the (a) portion of Tension Regulator and/or (b) portion of TG-2 is acceptable within the range shown in Fig. 5. Tape curl at the drum, however, is not acceptable.
- (4) Put the unit into the REV x 1 mode.
- (5) Check that the RF waveform envelope is small at the drum entrance side as shown in Fig. 6.
- (6) Put the unit into the PLAY mode. Turn the adjusting nut of TG-1 so that the tape runs in contact with the guide flange at the (a) portion. The tape curl at (a) portion is acceptable within the range shown in Fig. 5.
- (7) Put the unit into the REV x 1 mode. Check that the RF envelope waveform is flat and the tape-to-head contact meets the required specification.

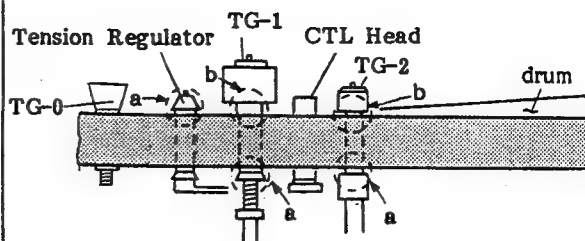
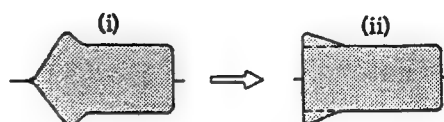


Fig. 2



When tape portion "a" of the Tension Regulator shown in Fig. 2 is pressed down, the waveform should be flat.

Fig. 3

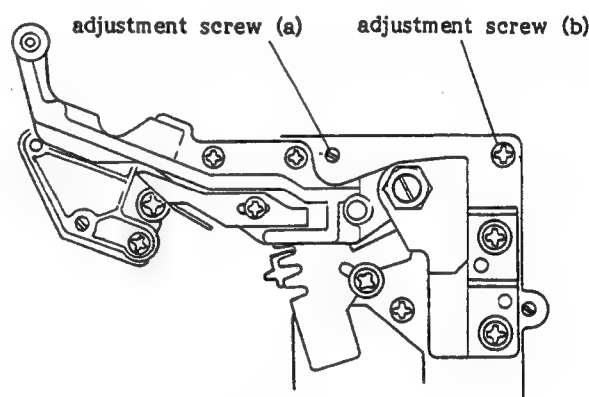


Fig. 4

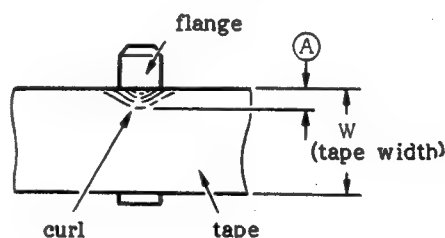


Fig. 5

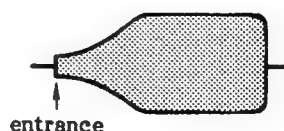


Fig. 6



- (8) Put the unit into the PLAY mode. Check that the tape-to-head contact meets the required specification.
- (9) Tighten the setscrews of each tape guide, and check again.
- (10) Restore the DIP switch setting as described in preparation steps (1) and (2).

. When the tracking at the drum exit side is not good.

- (1) Turn the adjusting nuts of TG-3 and TG-4, and make clearances at (a) of TG-3, (b) of TG-4, and (a) and (b) of the Tape Threading Guide as shown in Fig. 7.
- (2) Turn the adjusting nut of TG-4 so that the RF waveform envelope changes from state (i) to state (ii) shown in Fig. 8. Check that the tape does not in contact with the guide flange at the (a) portion of TG-3 or (a) portion of the Tape Threading Guide.
- (3) Turn the adjusting nut of TG-3 so that the tape runs in contact with the guide flange at the (a) portion of TG-3 and the RF waveform envelope flattens. The tape curl is acceptable within the range shown in Fig. 5.
- (4) Turn the adjusting nut of the Tape Threading Guide so that the tape runs lightly in contact with the guide flange at the (a) portion.
- (5) Check that the tape-to-head contact meets the required specification.
- (6) Put the unit into the REV x 1 mode.
- (7) Check that the RF waveform envelope is flat and the tape-to-head contact meets the required specification.
- (8) Tighten the setscrews of each tape guide, and check again.
- (9) Restore the DIP switch setting as described in preparation steps (1) and (2).

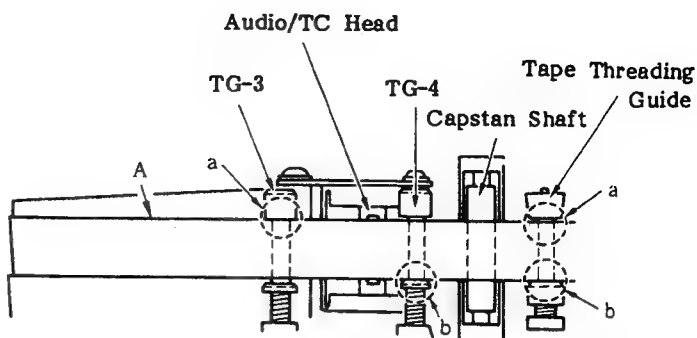
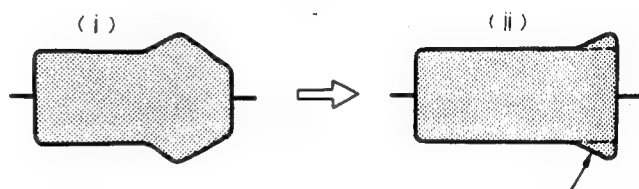


Fig. 7



When tape portion "A" shown in Fig. 7 is pressed down, the waveform should be flat.

Fig. 8

## 8-2. AUDIO/TC HEAD ADJUSTMENT

### 8-2-1. Audio/TC Head Height Adjustment

**Tool:** Alignment tape, CR8-1A PS  
Dual-trace oscilloscope or VTVM

**Mode:** Play back the alignment tape.

**Preparation:**

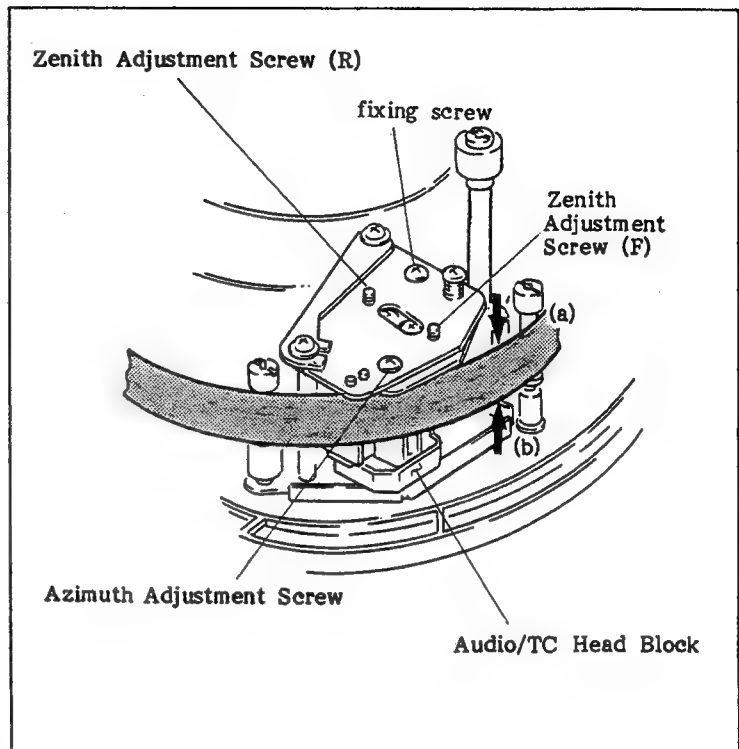
- (1) Check that the "DOLBY NR" switch on the Sub Panel is off. (The Dolby NR (Noise Reduction) circuit is off.)
- (2) Connect the oscilloscope or VTVM to the AUDIO OUT CH-1 or CH-2.
- (3) Play back the last 1kHz signal segment on the alignment tape. (Never play back the 1kHz signal segment at the tape top.)

**Check procedure:**

- (1) When pressing down the tape at (a) portion, check that the level decreases.
- (2) When pushing up the tape at (b) portion, check that the level decreases.

**Adjustment procedure:**

- When the level increase while pressing down the tape at (a) portion.
  - (1) Remove the Cleaning Roller Block.
  - (2) Loosen the fixing screw of the Audio/TC Head to 3 turns.
  - (3) Turn the Zenith Adjustment Screws (R) and (F) in the counterclockwise direction and turn the Azimuth Height Adjustment Screw in the clockwise direction an exactly equal amount. Adjust for maximum output waveform.
  - (4) Tighten the fixing screw and check again.



. When the level increases while pushing up the tape at (b) portion.

- (5) Turn the Zenith Adjustment Screws (R) and (F) in the clockwise direction and turn the Azimuth Height Adjustment Screw in the counterclockwise direction an exactly equal amount. Adjust for maximum output waveform.
- (6) Tighten the fixing screw and check again.
- (7) Perform Section 8-2-2, Audio/TC Head Zenith Adjustment; Section 8-2-3, Audio/TC Head Azimuth Adjustment; Section 8-2-4, Audio/TC Head Phase Adjustment; and Section 8-2-5, Audio/TC Head Position Adjustment.
- (8) Install the Cleaning Roller Block, perform Section 6-9, Cleaning Roller Position Adjustment.

## 8-2-2. Audio/TC Head Zenith Adjustment

**Tool:** Flatness plate

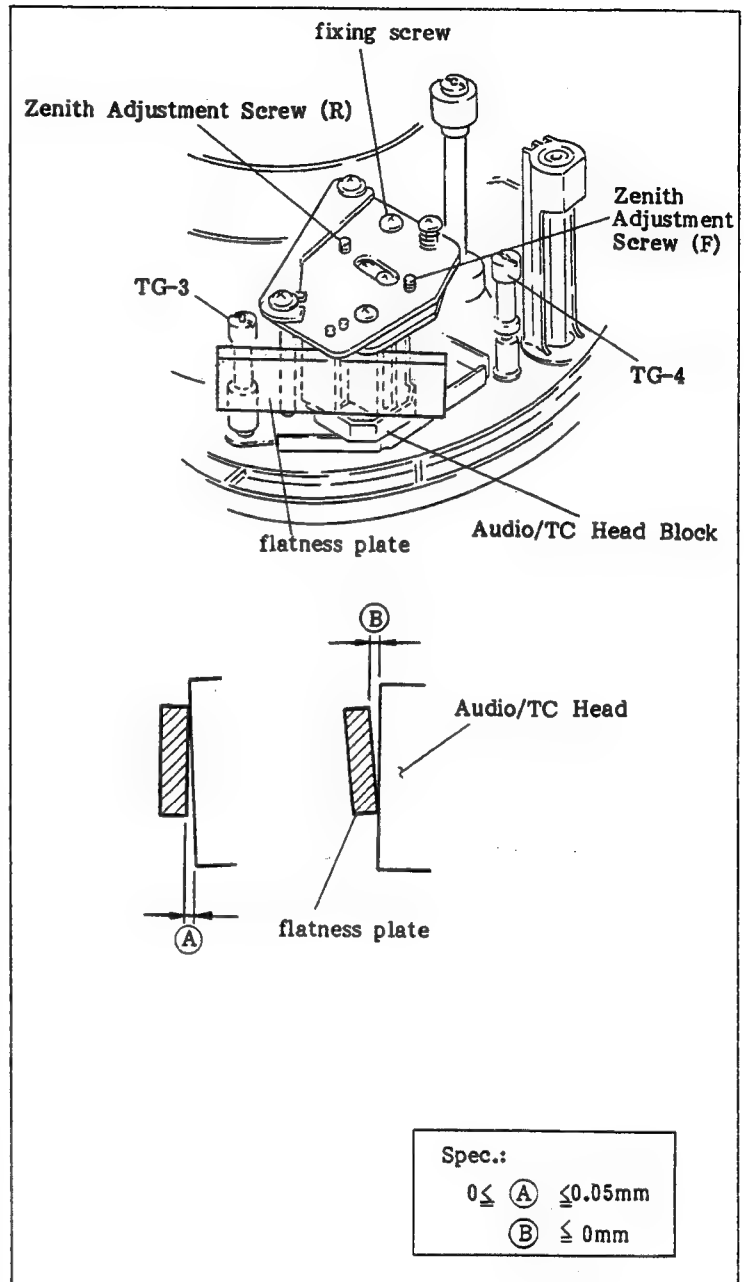
**Mode:** Unthreading end mode

### Check procedure:

- (1) Check that the clearance between the head and the flatness plate meets the required specification when the flatness plate is placed on the Audio/TC Head and the TG-3.

### Adjustment procedure:

- . If there is the clearance at the bottom.
  - (1) Remove the Cleaning Roller Block.
  - (2) Loosen the fixing screw of the Audio/TC Head Block 1/4 to 1 turn.
  - (3) Turn the Zenith Adjustment Screw (R) in the clockwise direction to meet the required specification.
  - (4) Tighten the fixing screw and check again.
- . If there is the clearance at the top.
  - (5) Loosen the fixing screw of the Audio/TC Head Block 1/4 to 1 turn.
  - (6) Turn the Zenith Adjustment Screw (R) in the counterclockwise direction to meet the required specification.
  - (7) Tighten the fixing screw and check again.
- (8) After adjustment, perform Section 8-2-1, Audio/TC Head Height Adjustment; Section 8-2-3, Audio/TC Head Azimuth Adjustment; Section 8-2-4, Audio/TC Head Phase Adjustment; and Section 8-2-5, Audio/TC Head Position Adjustment.
- (9) Install the Cleaning Roller Block, perform Section 6-9, Cleaning Roller Position Adjustment.



### 8-2-3. Audio/TC Head Azimuth Adjustment

**Tool:** Alignment tape, CR8-1B PS  
Dual-trace oscilloscope or VTVM

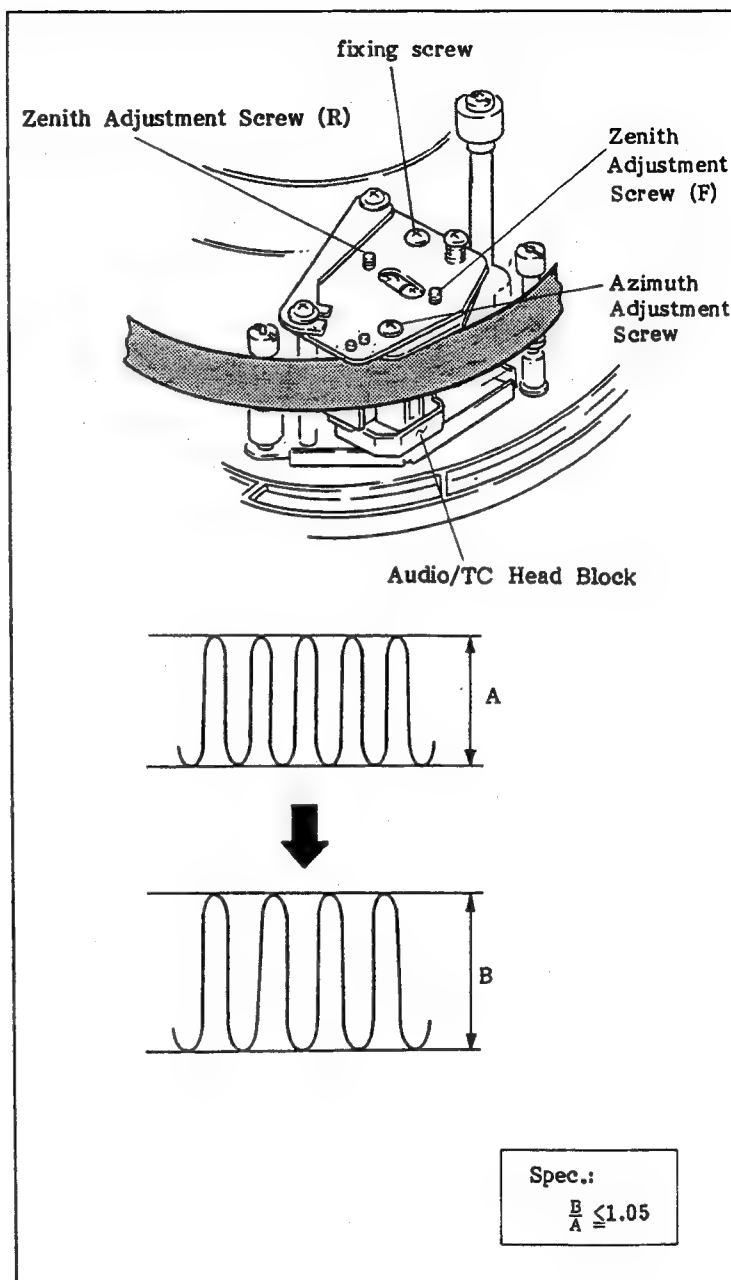
**Mode:** Play back the alignment tape.

**Preparation:**

- (1) Check that the "DOLBY NR" switch on the Sub Panel is off. (Dolby NR (Noise Reduction) circuit is off.)
- (2) Connect the oscilloscope to the AUDIO OUT CH-1 or CH-2 terminal.
- (3) Play back the audio 10kHz signal portion on the alignment tape.

**Adjustment procedure:**

- (1) Remove the Cleaning Roller Block.
- (2) Loosen the fixing screw of the Audio/TC Head 1 turn.
- (3) Adjust for the maximum output level by turning the Azimuth Height Adjustment screws.
- (4) When holding down the tape near the drum with a skewer, check that the change of the level meets the required specification. Tighten the fixing screw, check again.
- (5) Perform Section 8-2-4, Audio/TC Head Phase Adjustment; Section 8-2-1, Audio/TC Head Height Adjustment; and Section 8-2-5, Audio/TC Head Position Adjustment.
- (6) Install the Cleaning Roller Block, Perform Section 6-9, Cleaning Roller Position Adjustment.



#### 8-2-4. Audio/TC Head Phase Adjustment

**Tool:** Alignment tape, CR8-1B PS  
Dual-trace oscilloscope

**Mode:** Play back the alignment tape.

**Preparation:**

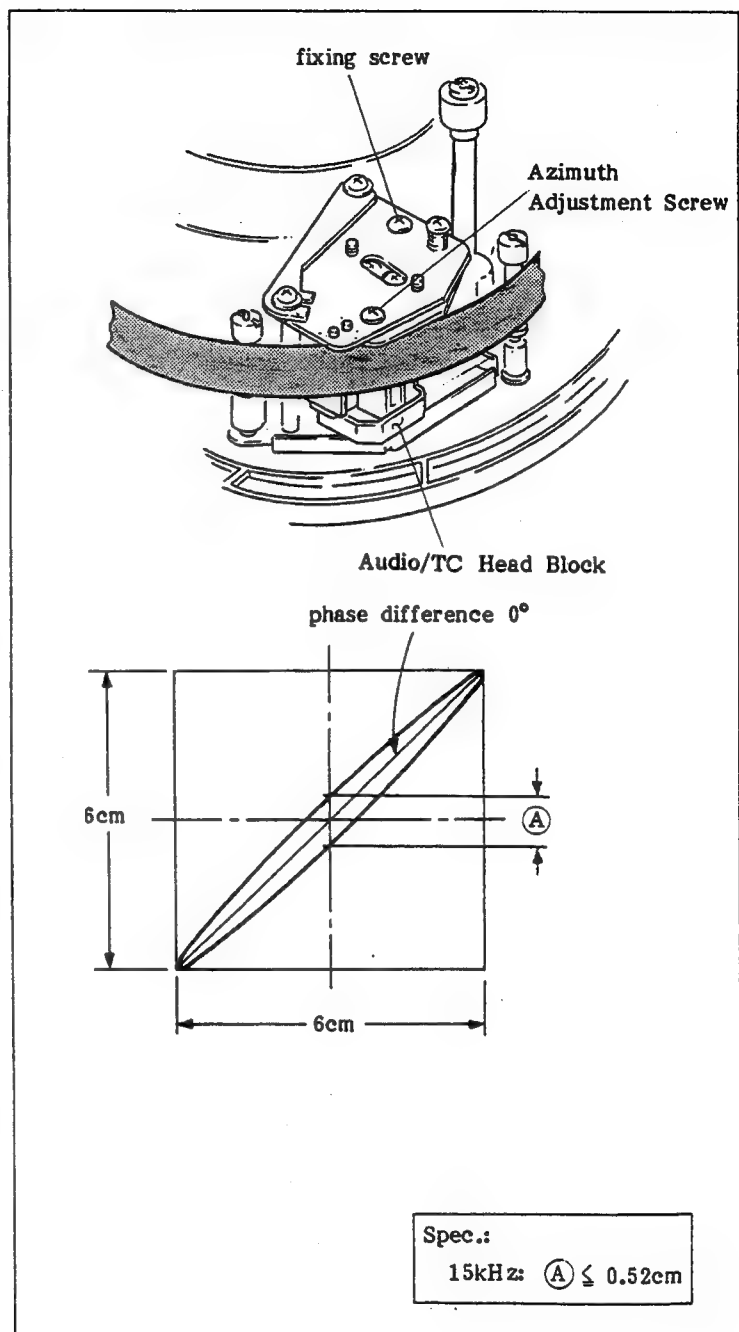
- (1) Check that the "DOLBY NR" switch on the Sub Panel is off. (The Dolby NR (Noise Reduction) circuit is off.)
- (2) Connect the horizontal and vertical terminals of the oscilloscope to the AUDIO OUT CH-1 and CH-2 terminals.
- (3) Play back the audio 15kHz portion on the alignment tape.
- (4) Adjust the scope for horizontal and vertical amplitudes for a 6 cm lissajous waveshape.

**Check procedure:**

- (1) Check that the vertical amplitude at the center in the horizontal direction is within the specification.
- (2) Check that the lissajous waveshape meets the required specification at 15kHz.

**Adjustment procedure:**

- (1) Remove the Cleaning Roller Block.
- (2) Loosen the fixing screw 1/4 to 1/2 turn.
- (3) Turn the Azimuth Height Adjustment Screw to meet the required specification.
- (4) Tighten the fixing screw and check again.
- (5) Install the Cleaning Roller Block, perform Section 6-9, Cleaning Roller Position Adjustment.



### 8-2-5. Audio/TC Head Position Adjustment

. It is required that the Section 8-3-3, CTL Head Position Adjustment is checked to be correct before initiating this adjustment.

**Tool:** Alignment tape, CR2-1B PS  
Dual-trace oscilloscope

**Mode:** Play back the alignment tape.

**Preparation:**

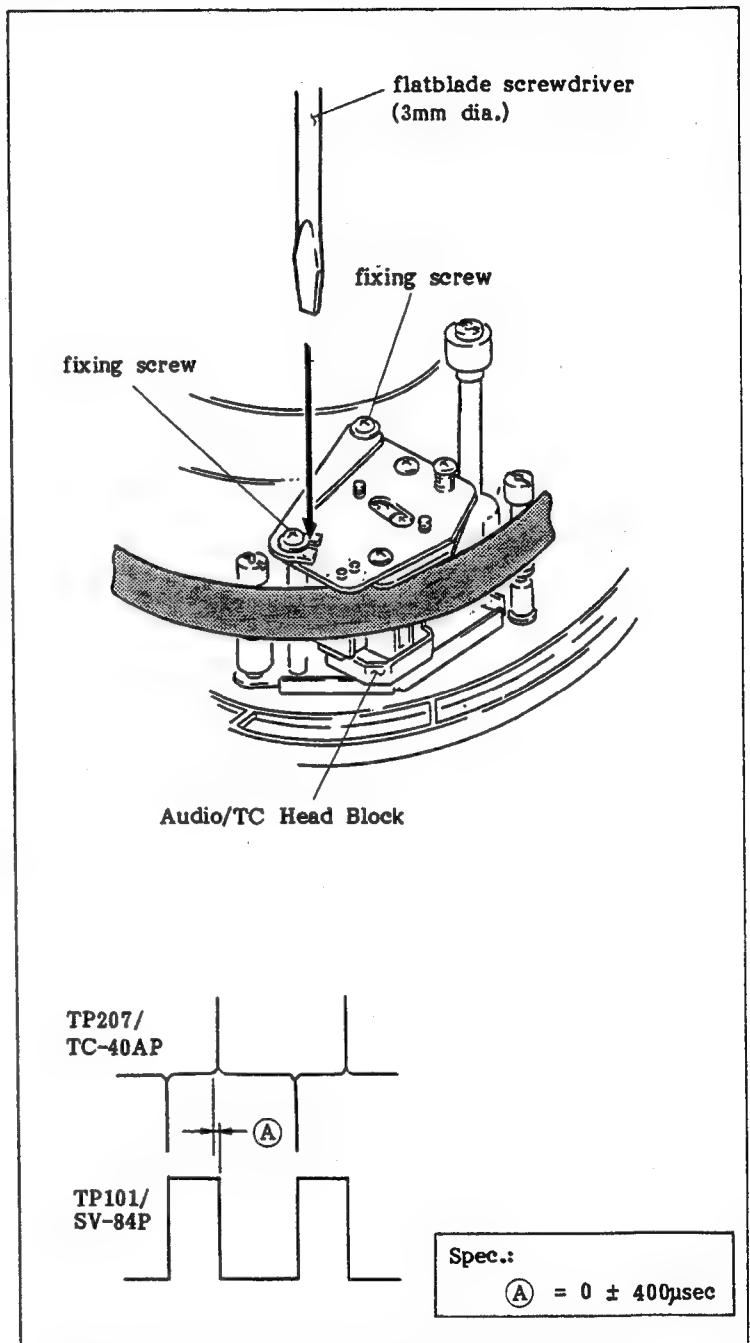
- (1) Connect the oscilloscope as follows:  
CH-1: TP101/SV-84P Board  
CH-2: TP207/TC-40AP Board  
TRIG: INTERNAL, CH-1
- (2) Play back the alignment tape.

**Check procedure:**

- (1) Check that the waveform meets the required specification.

**Adjustment procedure:**

- (1) Remove the Cleaning Roller Block.
- (2) Loosen the fixing screws.
- (3) Adjust the position of the head block with a flatblade screwdriver (3 mm dia.) to meet the required specification.
- (4) Tighten the fixing screws, check again.
- (5) Perform Section 8-2-1, Audio/TC Head Height Adjustment; Section 8-2-2, Audio/TC Head Zenith Adjustment; Section 8-2-3, Audio/TC Head Azimuth Adjustment; and Section 8-2-4, Audio/TC Head Phase Adjustment.
- (6) Install the Cleaning Roller Block, perform Section 6-9, Cleaning Roller Position Adjustment.



### 8-3. CTL HEAD ADJUSTMENT

#### 8-3-1. CTL Head Height Adjustment

**Tool:** Alignment tape, CR8-1A PS  
Oscilloscope

**Mode:** Play back the alignment tape.

**Preparation:**

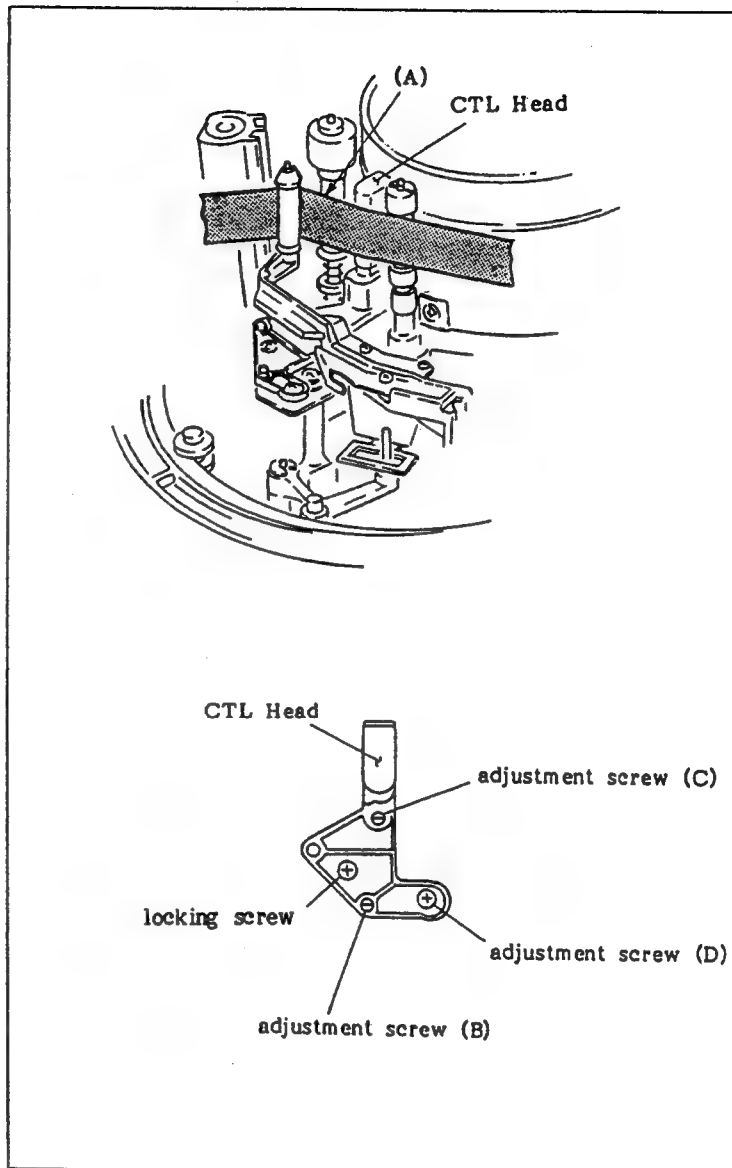
- (1) Remove the SV-84P Board, extend it with an Extension Board.
- (2) Connect the oscilloscope as follows:  
CH-1: TP100/SV-84P Board  
TRIG: INTERNAL, CH-1
- (3) Turn DIP switch S101-bit 3 on the SV-82A Board to on.
- (4) Insert the alignment tape, and play back the audio 1kHz signal portion recorded on the CTL track of the alignment tape.

**Check procedure:**

- (1) When pressing the tape down and pushing it up at (A) portion, check that both levels decrease. If the levels increase, the following adjustments are required.

**Adjustment procedure:**

- . When the levels increase while pressing down the tape at (A) portion.
  - (1) Loosen the locking screw 1 turn.
  - (2) Turn the adjustment screw (D) in the counterclockwise direction and turn the adjustment screws (C) and (B) in the clockwise direction an exactly equal amount. Adjust for maximum output waveform.
  - (3) Tighten the locking screw and check again.
- . When the levels increase while pushing up the tape at (A) portion.
  - (4) Loosen the locking screw 1 turn.
  - (5) Turn adjustment screw (D) in the clockwise direction and turn the adjustment screws (C) and (B) in the counterclockwise direction an exactly equal amount. Adjust the maximum output waveform.





- (6) Tighten the locking screw and check again.
- (7) After adjustment, perform Section 8-3-2, CTL Head Azimuth/Zenith Adjustment; and Section 8-3-3, CTL Head Position Adjustment.
- (8) Turn DIP switch S101-bit 3 on the SV-82A Board to off.

### 8-3-2. CTL Head Azimuth/Zenith Adjustment

**Tool:** Cassette reference plate (L)

Tension regulator slantness check tool

**Mode:** Threading end mode

**Check procedure:**

- (1) Install the cassette reference plate (L) into the cassette position.
- (2) Place the tension regulator slantness check tool at the CTL Head as shown in the figure. Check that the slantness of the CTL Head meets the required specification.

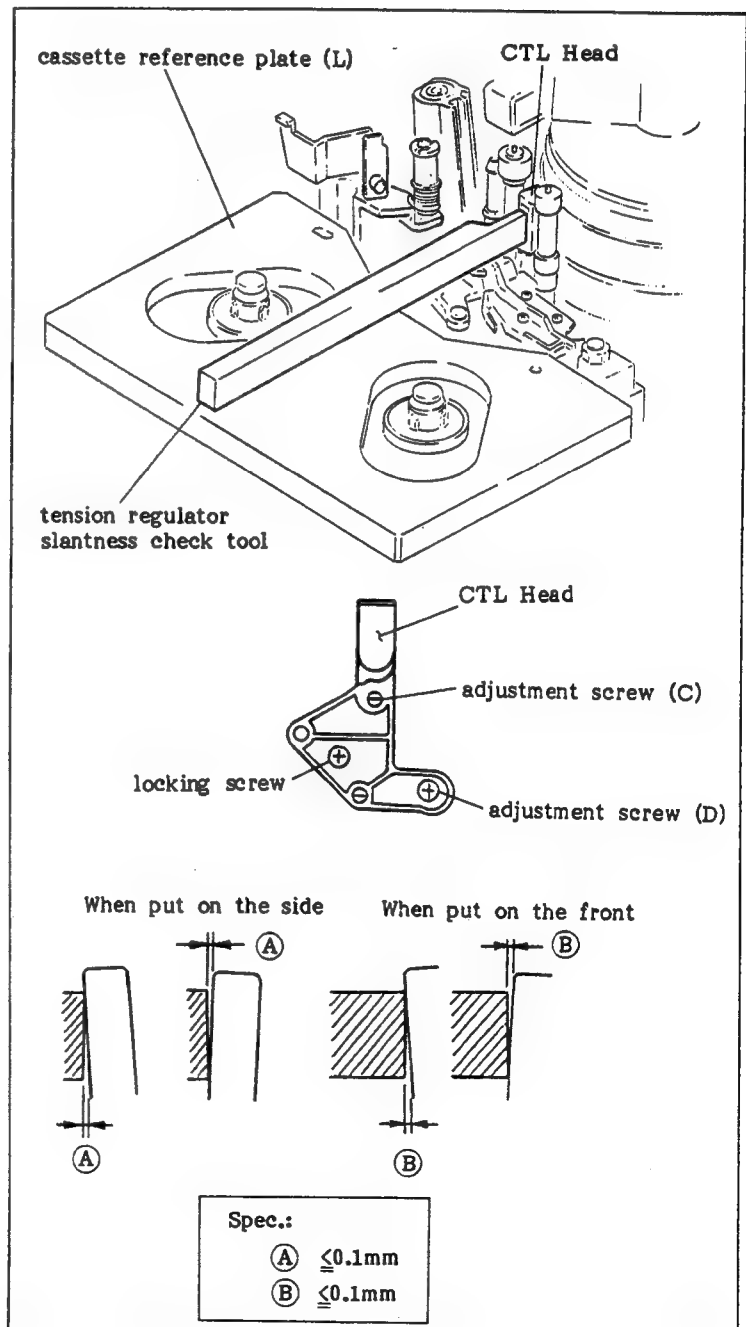
**Adjustment procedure:**

. When the zenith is out of spec.

- (1) Loosen the locking screw 1 turn.
- (2) Adjust the zenith with adjustment screw (C) to meet the required specification.
- (3) Tighten the locking screw and check the azimuth and zenith.

. When the azimuth is out of spec.

- (4) Loosen the locking screw 1 turn.
- (5) Adjust the azimuth with adjustment screw (D) to meet the required specification.
- (6) Tighten the locking screw and check the azimuth and zenith.
- (7) After adjustment, perform Section 8-3-1, CTL Head Height Adjustment; and Section 8-3-3, CTL Head Position Adjustment.



### 8-3-3. CTL Head Position Adjustment

**Tools:** Alignment tape, CR2-1B PS  
Oscilloscope

**Mode:** Play back the alignment tape.

**Preparation:**

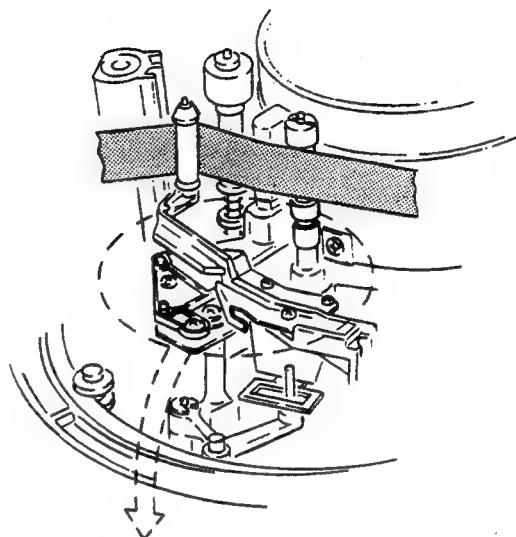
- (1) Turn DIP switch S101-bit4 on the SV-82A Board to "ON". (The phi-square servo circuit is off.)
- (2) Turn DIP switch S1 on the SV-83B Board is on. (The H-LOCK servo circuit is off.)
- (3) Remove the DM-56P Board, extend it with an Extension Board.
- (4) Connect the oscilloscope as follows:  
CH-1: TP6/DM-56P Board  
EXT. TRIG: TP901/DM-56P Board
- (5) Play back the alignment tape.

**Check procedure:**

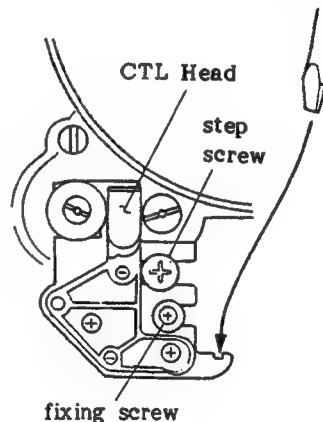
- (1) Turn DIP switch S101-bit2 on the SV-82A Board to "ON". Turn RV102 until the RF envelope waveform is maximum. Check that the RF envelope level does not change when S101-bit2 is turned to "OFF".

**Adjustment procedure:**

- (1) Loosen the fixing screw 1/4 to 1/2 turn.
- (2) Insert a flatblade screwdriver (3 mm dia.) into the hole of the CTL Head Base. Adjust the position of the CTL Head. Block to meet the required specification.
- (3) After adjustment, perform Section 8-2-5, TC Head Position Adjustment.
- (4) Turn DIP switch S101-bit2 to OFF and restore the DIP switch setting as described in preparation steps (1) and (2).



flatblade screwdriver (3mm dia.)



#### 8-4. T DRAWER GUIDE BLOCK TAPE RUN ADJUSTMENT

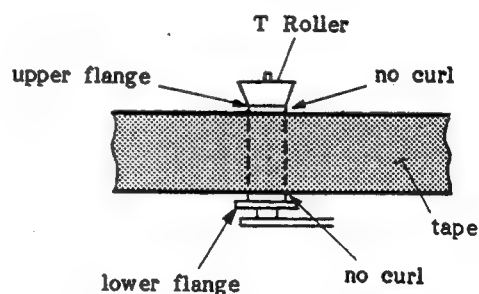
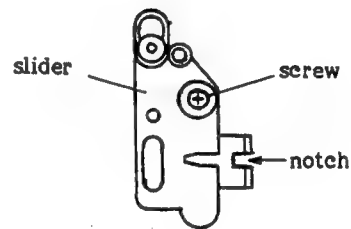
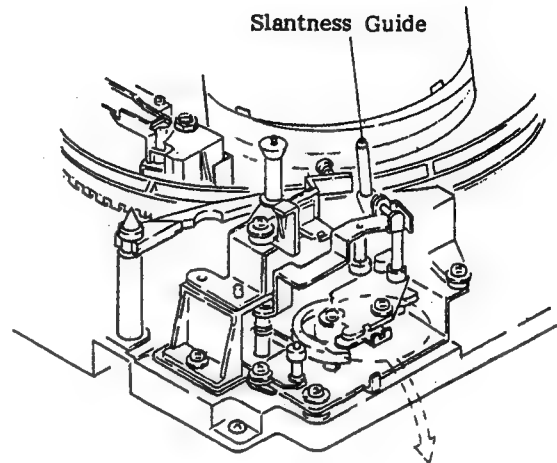
##### Check procedure:

- (1) Insert the BCT-20M cassette tape and press the PLAY button.
- (2) Check that the tape runs in the tape width direction before and behind a Slantness Guide without uneven tape tension.
- (3) Check that no tape curl occurs on the upper and lower flanges of the T Roller.
- (4) Pres the F.FWD button.
- (5) Check that the tape runs and no tape curl occurs as described in procedures (2) and (3).
- (6) Press the REW button.
- (7) Check that the tape runs and no tape curl occurs as described in procedures (2) and (3).

##### Adjustment procedure:

- When the upper edge of the tape slackens or the tape curl occurs on the upper flange.
  - (1) Loosen the fixing screw as shown in the figure.
  - (2) Insert the flatblade screwdriver into the notch and turn it moving counterclockwise.
- When the lower edge of the tape slackens or the tape curl occurs on the lower flange.
  - (3) Loosen the fixing screw as shown in the figure.
  - (4) Insert the flatblade screwdriver into the notch and turn it moving clockwise.
  - (5) After adjustment, tighten the fixing screw and check again.

Note: To prevent a slider from damage, put your fingers under the slider when loosening or tightening the screw. Then, hold the screwdriver's force with your fingers.



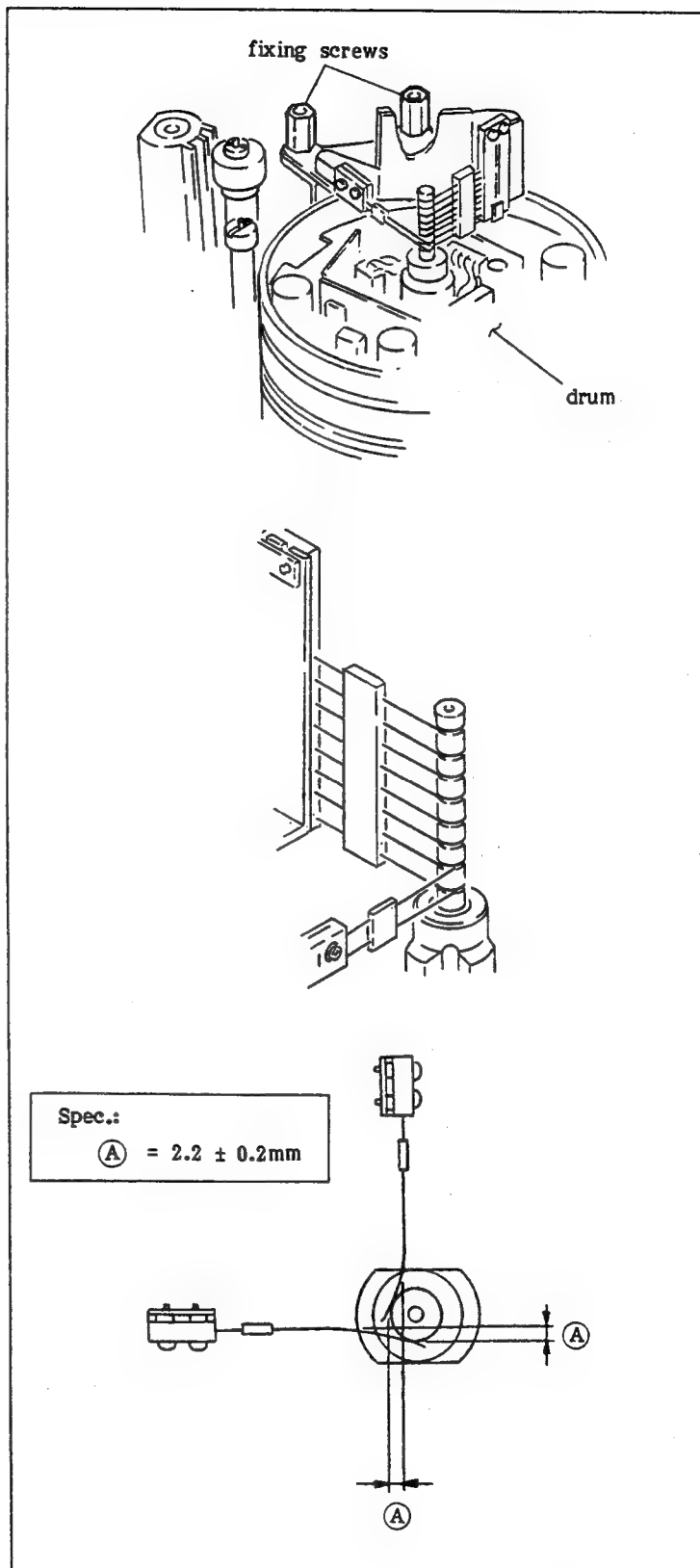
## 8-5. SLIP RING BRUSH POSITION ADJUSTMENT

### Check procedure:

- (1) Check that the position of the brush and ring meets the required specification.
- (2) Check that the brush is in the groove of the ring as shown in the figure.

### Adjustment procedure:

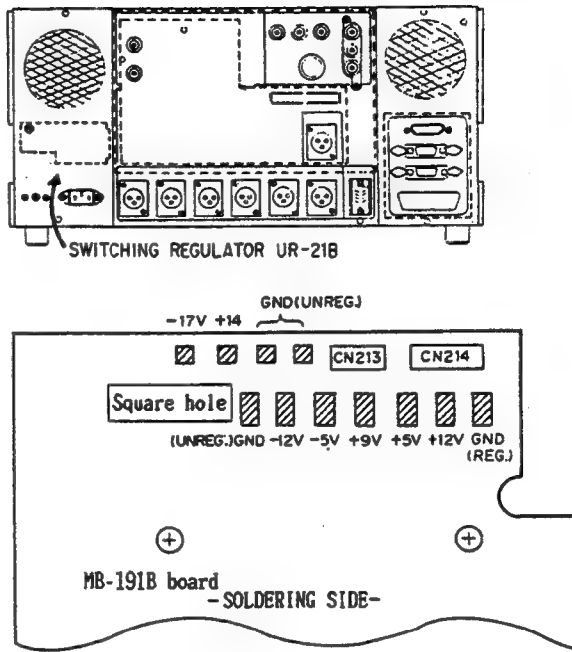
- (1) Remove the Brush Cover.
- (2) Loosen the fixing screws 1/2 to 1 turn.
- (3) Adjust the position of the brush so that it is in the groove of the ring and bending meets the required specification.
- (4) Tighten the fixing screws and check again.
- (5) Install the Brush Cover.



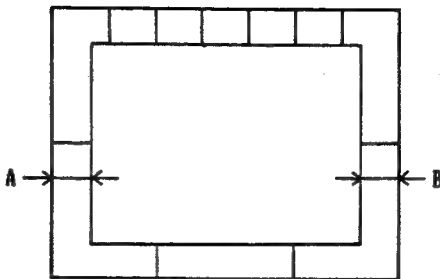
## SECTION 9

### POWER AND CONTROL SYSTEM ALIGNMENT

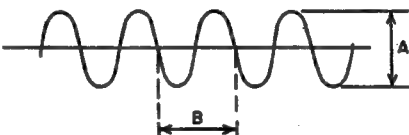
#### 9-1. DC VOLTAGE REGULATOR (UR-21B) ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Remove the power block from the unit. (Refer to Sec. 4-3.)</li> <li>Connect the connectors again.</li> <li>Solder the lead wires at the land on the MB-191B board (at the back of the main unit), and connect a digital voltmeter to the lead wire.</li> <li>Turn on the power.</li> <li>Insert a blank tape and put the unit into the PLAY mode.</li> <li>Using an alignment tool, adjust the voltage from the outside of the switching regulator's outer cabinet.</li> </ul>	<p>Connector Panel</p> 	
	<ul style="list-style-type: none"> <li>+12V adjustment Between +12V regulator and GND land/MB-191B <math>+12.1 \pm 0.3\text{Vdc}</math></li> </ul>	<p>Switching regulator RV51/UR-21B-C2 (+12V ADJ)</p>
	<ul style="list-style-type: none"> <li>-12V adjustment Between -12V regulator and GND land/MB-191B <math>-12.1 \pm 0.3\text{Vdc}</math></li> </ul>	<p>Switching regulator RV251/UR-21B-M2 (-12V ADJ)</p>
	<ul style="list-style-type: none"> <li>+5V adjustment Between +5V regulator and GND land/MB-191B <math>+5.1 \pm 0.25\text{Vdc}</math></li> </ul>	<p>Switching regulator RV51/UR-21B-C1 (+5V ADJ)</p>
	<ul style="list-style-type: none"> <li>-5V adjustment Between -5V regulator and GND land/MB-191B <math>-5.1 \pm 0.25\text{Vdc}</math></li> </ul>	<p>Switching regulator RV201/UR-21B-M1 (-5V ADJ)</p>
<ul style="list-style-type: none"> <li>After adjustment is completed, install the switching regulator and other parts.</li> </ul>		

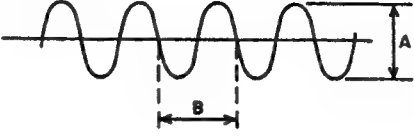
## 9-2. VIDEO OUT-3 CHARACTER POSITION ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a color-bar signal of alignment tape CR5-1B PS.</li> <li>• Connect a monitor to the VIDEO OUT 3 connector.</li> <li>• Set S101 (CHARACTER switch) on the SY-61A board to ON and press S103 (SETUP MENU switch) on the SY-61A board.</li> </ul>	 <p style="text-align: center;">A = B (A - B should be within a 1/4 scale of the section)</p>	<p>Position            ⓄCV102/SY-61A(C-7)</p>
<ul style="list-style-type: none"> <li>• Press S103 on the SY-61A board again.</li> </ul>		<p>H side            ⓄCV101/SY-61A(C-7)</p>

## 9-3. TAPE BEGINNING SENSOR OSCILLATION LEVEL CHECK

machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>• S101-Bit1/SV-82A: ON</li> <li>• MODE: STOP</li> <li>• Minimize the center fluctuation in the oscilloscope's TRIG level.</li> <li>• Check that the waveform satisfies specification 1.</li> </ul> <p>Step 2</p> <ul style="list-style-type: none"> <li>• Place the tape beginning sensor near a screwdriver.</li> <li>• Check that specification 2 is satisfied.</li> <li>• After adjustment is completed, set S101-Bit 1 to OFF.</li> </ul>	<p>TP402/SY-64AP(I-7)</p>  <p>Spec 1 : A = 200 mVp-p or more            B = <math>5 \pm 0.6 \mu\text{sec}</math></p> <p>Spec 2 : Check that the mode is selected into FF.</p>	<p>TRIG: INT</p>

#### 9-4. TAPE END SENSOR OSCILLATION LEVEL CHECK

machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>• S101-Bit1/SV-82A: ON</li> <li>• MODE: STOP</li> <li>• Minimize the center fluctuation in the oscilloscope's TRIG level.</li> <li>• Check that the waveform satisfies specification 1.</li> </ul> <p>Step 2</p> <ul style="list-style-type: none"> <li>• Place the tape end sensor near a screwdriver.</li> </ul> <p>Check that specification 2 is satisfied.</p> <ul style="list-style-type: none"> <li>• After adjustment is completed, set S101-Bit 1 to OFF.</li> </ul>	<p>TP404/SY-64AP(I-6)</p>  <p>Spec 1 : <math>A = 200 \text{ mVp-p or more}</math>  <math>B = 3.3 \pm 0.6 \mu\text{sec}</math></p> <p>Spec 2 : Check that the mode is selected into REW.</p>	<p>TRIG: INT</p>





## SECTION 10

### SERVO SYSTEM ALIGNMENT

#### 【Equipment Required】

- DC voltmeter
- Dual-trace oscilloscope
- Frequency counter
- Shorting clip
- Alignment tape CR2-1B PS
- Alignment tape CR5-2A PS
- Alignment tape CR5-1B PS

#### 【Video Signals Required】

- PAL video signal: This is a video signal provided with a specified sync signal that can be used for both color, and black and white systems.

#### 10-1. PREPARATION

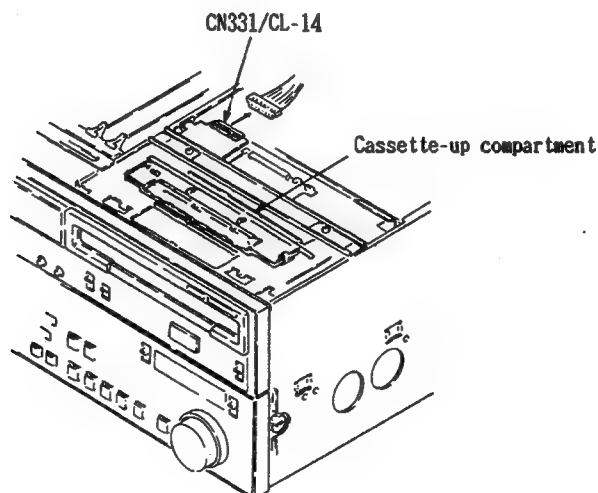
Since the machine may start runaway tape operation when the SV-83B board, reel table, and reel table rotation detecting element (DME) are replaced, the following adjustments should be performed before inserting a cassette tape.

- Section 10-3 Supply Reel FG Duty Cycle Adjustment
- Section 10-4 Take-up FG Duty Cycle Adjustment

When the SV-84P board and head drum are replaced, perform Section 10-9 Drum Free Speed Adjustment.

How to operate the machine without a cassette tape

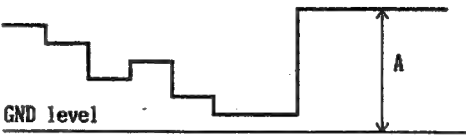
- Remove CN331 on the CL-14 board and take out the cassette-up compartment.
- Set S101-Bit 1 on the SV-82A board to ON.
- When the STOP button is pressed, the threading ring rotates counterclockwise.



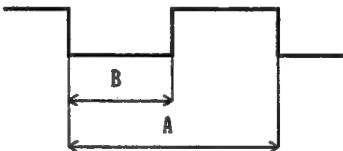
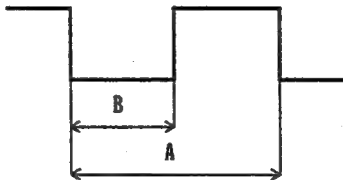
**PLAY:** Set S106 on the SV-61A board to ON, System Setup Item 902 to 1, and then press the PLAY button.

After adjustment is completed, set S106 to OFF and Item 902 to "0".

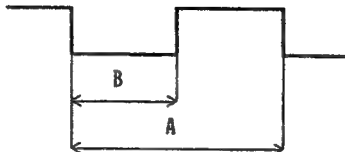
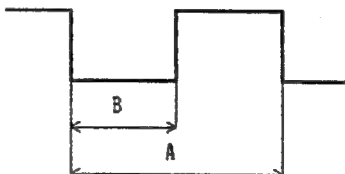
## 10-2. D/A OUTPUT VOLTAGE ADJUSTMENT

machine conditions for adjustment	specification	adjustments
<ul style="list-style-type: none"> <li>• MODE: Any mode</li> </ul>	<p>CH-1: TP103/SV-82A(E-5) CH-2: TP101/SV-82A(E-4)</p>  <p>A: Make the voltage at TP103 on the SV-82A same as that at TP101 on the SV-82A board.</p>	<p>RV101/SV-82A(E-4)</p> <p>TRIG(+): TP104/SV-82A(E-5)</p>

## 10-3. SUPPLY REEL FG DUTY CYCLE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back alignment tape CR2-1B PS at about 10 minute-portion from tape top.</li> </ul>	<p>TP7/SV-83B(D-8)</p>  <p>Duty cycle (B/A) = <math>50 \pm 5\%</math></p>	<p>RV9/SV-83B(B-4)</p> <p>TRIG: TP7/SV-83B(D-8)</p>
	<p>TP8/SV-83B(D-7)</p>  <p>Duty cycle (B/A) = <math>50 \pm 5\%</math></p>	<p>RV10/SV-83B(C-4)</p> <p>TRIG: TP8/SV-83B(D-7)</p>

#### 10-4. TAKE-UP REEL FG DUTY CYCLE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back alignment tape CR2-1B PS at about 10 minute-portion from tape top.</li> </ul>	TP9/SV-83B (D-8)    Duty cycle $(B/A) = 50 \pm 5\%$	ⒶRV11/SV-83B (B-4)     TRIG: TP9/SV-83B (D-8)
	TP10/SV-83B (D-8)    Duty cycle $(B/A) = 50 \pm 5\%$	ⒶRV12/SV-83B (A-4)     TRIG: TP10/SV-83B (D-8)

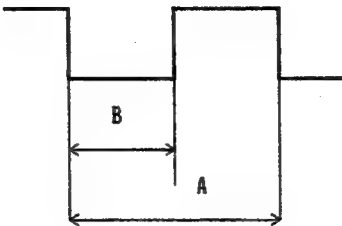
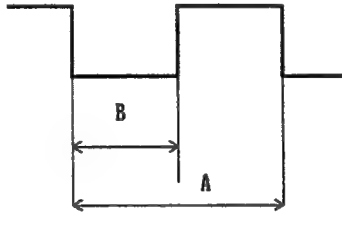
#### 10-5. TENSION SENSOR IMPRESSED VOLTAGE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• S101-Bit1/SV-82A: ON</li> <li>• MODE: STOP</li> <li>• Make adjustments only after the power has been ON for 30 seconds or more.</li> <li>• After adjustment is completed, set the S101-Bit1 to OFF.</li> </ul>	TP1/SV-83B (A-8)   $+9.0 \pm 0.1 \text{ Vdc}$	ⒶRV1/SV-83B (B-7)

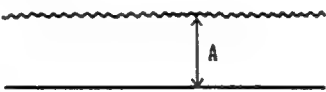
#### 10-6. TENSION SENSOR AMP OFFSET ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• S101-Bit1/SV-82A: ON</li> <li>• Using a shorting clip, short between TP4 on the SV-83B board and TP5 on the SV-83B board.</li> <li>• MODE: STOP</li> <li>• After adjustment is completed, remove the shorting clip and set S101-Bit 1 to OFF.</li> </ul>	TP3/SV-83B (A-8)   $+2.5 \pm 0.04 \text{ Vdc}$	ⒶRV2/SV-83B (A-8)


# 10-7. CAPSTAN FG DUTY CYCLE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>CAPSTAN LOCK sw: 2FD</li> <li>Insert alignment tape CR2-1B PS and put the unit into the PLAY mode.</li> </ul>	TP1/SV-84P(C-7)  $B/A = 50 \pm 5\%$	RV2/SV-84P(C-6)  TRIG(-): TP1/SV-84P(C-7)
	TP2/SV-84P(C-7)  $B/A = 50 \pm 5\%$	RV3/SV-84P(C-5)  TRIG(-): TP2/SV-84P(C-7)

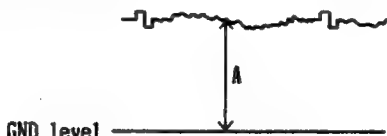
# 10-8. CAPSTAN FREE SPEED ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Insert alignment tape CR2-1B PS and put the unit into the PLAY mode.</li> </ul>	TP4/SV-84P(F-9)  $A = 2.5 \pm 0.1 \text{ V}$	RV1/SV-84P(D-4)

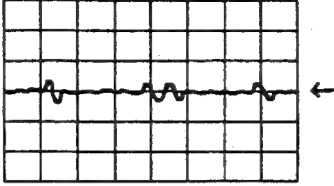

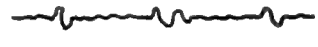
# 10-9. DRUM FREE SPEED ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Using a shorting clip, short between TP106 and TP107 on the SV-84P board.</li> <li>S101-Bit4/SV-82A; ON</li> <li>Insert alignment tape CR2-1B PS and put the unit into the PLAY mode.</li> </ul> <p>After adjustment is completed, remove the shorting clip.</p>	<p>TP105/SV-84P(D-8)</p>  <p><math>A = 2.5 \pm 0.1 \text{ V}</math></p>	<p>RV102/SV-84P(C-2)</p>

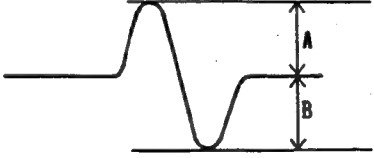
# 10-10. CAPSTAN STOP SERVO BIAS ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Insert alignment tape CR2-1B PS and put the unit into the SEARCH STILL mode.</li> <li>Repeat FWD-STILL operation several times in the JOG mode. Check where the voltage at TP3 is minimized, then adjust.</li> </ul>	<p>TP3/SV-84P(G-4)</p>  <p><math>A = 0.3 \pm 0.02 \text{ Vdc}</math></p>	<p>RV103/SV-82A(D-1)</p>

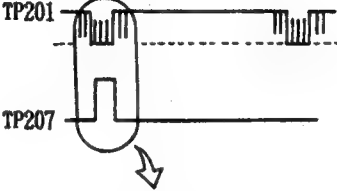
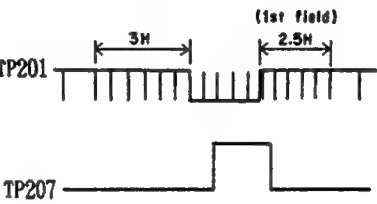
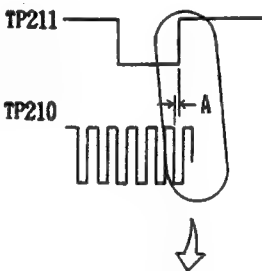
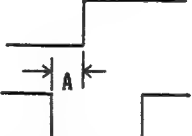
# 10-11. INSTANT START ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Insert alignment tape CR2-1B PS.</li> </ul> <p>Step 1</p> <ul style="list-style-type: none"> <li>MODE: PLAY</li> </ul>	<p>TP6/SV-84P(D-3)</p>  <p>After the servo is locked, adjust the waveform to the oscilloscope's center position. (Oscilloscope: DC mode)</p>	
<p>Step 2</p> <ul style="list-style-type: none"> <li>MODE: STILL</li> </ul>	<p>STILL mode </p> <p>PLAY mode </p> <p style="text-align: right;"><math>B</math></p> <p style="text-align: center;"><math>B = 0 \pm 0.2 \text{ Vdc}</math></p>	<p>RV4/SV-84P(E-5)</p>







# 10-12. CAPSTAN ACCELERATION CORRECTION ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Insert the BCT-90ML cassette.</li> <li>DT SELECT sw: SRC</li> <li>Turn the SEARCH dial and select five times and two times normal speeds.</li> </ul>	<p>TP3/SV-83B(A-8)</p>  <p style="text-align: center;"><math>A = 0 \pm 0.15 \text{ Vp-p}</math> <math>B = 0 \pm 0.15 \text{ Vp-p}</math></p>	<p>RV8/SV-83B(A-4)</p>

# 10-13. SV FRAMING/FRAMING PULSE WIDTH ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>Supply a color-bar signal to the REF VIDEO IN connector.</li> </ul>	<p>CH-1: TP201/SV-83B(C-1) CH-2: TP207/SV-83B(E-3)</p>  <p>Adjust RV210 on the SV-83B board so that one pulse is output every two fields.</p>  <p>Check that the pulse portion is in the first field.</p>	<p>RV210/SV-83B(E-5)</p>
<p>Step 2</p>	<p>CH-1: TP211/SV-83B(E-4) CH-2: TP210/SV-83B(E-4)</p>   <p><math>A = 8.0 \pm 0.5 \mu\text{sec}</math></p>	<p>RV210/SV-83B(E-5)</p> <p>Adjust RV210 to meet the both specifications of Steps 1 and 2.</p> <p>TRIG: TP207/SV-83B(E-3)</p>


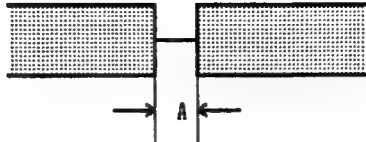


# 10-14. Y SWITCHING POSITION ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>DT SELECT sw: VAR</li> <li>S101- Bit4/SV-82A: ON</li> <li>Insert alignment tape CR2-1B PS and put the unit into the PLAY mode.</li> <li>Short between TP11/DT-14P and GND with a shorting clip.</li> </ul>	<p>TP901/DM-56P (C-1)</p>  <p>TP205/DM-56P (B-1)</p>  <p>Minimize A. (20 <math>\mu</math>sec or less)</p>	<ul style="list-style-type: none"> <li>RV201/SV-83B (D-2)</li> <li>RV203/DT-14P (C-5)</li> </ul> <p>TRIG (+): TP901/DM-56P (C-1)</p>
	<p>TP901/DM-56P (C-1)</p>  <p>TP205/DM-56P (B-1)</p>  <p>Minimize A. (20 <math>\mu</math>sec or less)</p>	<ul style="list-style-type: none"> <li>RV202/SV-83B (D-2)</li> </ul> <p>TRIG (-): TP901/DM-56P (C-1)</p>
	<p>TP901/DM-56P (C-1)</p> <p>TRIG (+)</p>  <p>TRIG (-)</p>  <p>Minimize A. (5 <math>\mu</math>sec or less)</p> <p>Select the TRIG SLOPE (+/-) and check that the phase difference satisfies the specification.</p>	<ul style="list-style-type: none"> <li>Fine adjustment</li> <li>RV201/SV-83B (D-2)</li> <li>RV202/SV-83B (D-2)</li> <li>RV203/DT-14P (C-5)</li> </ul> <p>TRIG: TP901/DM-56P (C-1)</p>

• After adjustment is completed, set S101-Bit4 on the SV-82A board to the former position and remove a shorting clip.

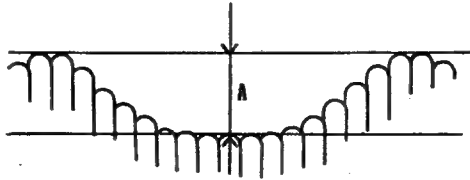


# 10-15. C SWITCHING POSITION ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>DT SELECT sw: VAR</li> <li>S101- Bit4/SV-82A: ON</li> <li>Insert alignment tape CR2-1B PS and put the unit into the PLAY mode.</li> <li>Short between TP11/DT-14P and GND with a shorting clip.</li> </ul>	TP902/DM-56P (F-1)  TP507/DM-56P (F-1)  Minimize A. Spec 1 (20 $\mu$ sec or less)	RV206/SV-83B (B-2)  TRIG (+): TP902/DM-56P (F-1)
	TP902/DM-56P (F-1) TRIG (-)  TRIG (+)  Minimize A. (5 $\mu$ sec or less)  Select the TRIG SLOPE (+/-) and check that the phase difference satisfies specification 2.	<ul style="list-style-type: none"> <li>Fine adjustment</li> </ul> RV206/SV-83B (B-2)  TRIG (+/-): TP902/DM-56P (F-1)

After adjustment is completed, make Section 10-17-8 DT Head Y/C Switching Pulse Adjustment.

# 10-16. PICTURE SPLITTING COMPENSATION ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a monoscope signal on alignment tape CR5-2A PS.</li> </ul>	CN208-15B/SV-84P (E-9)  A: Minimize.	RV100/SV-84P (D-1) RV101/SV-84P (E-2)

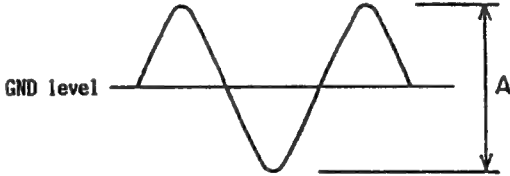
### 10-17. DT SERVO ADJUSTMENT

Before performing the DT Servo Adjustment, make Section 12-1-17 C RF AGC Output Level Adjustment, Section 12-1-6, Y RF AGC Output Level Adjustment, and Section 12-1-28 Y DOC Sensitivity Adjustment.


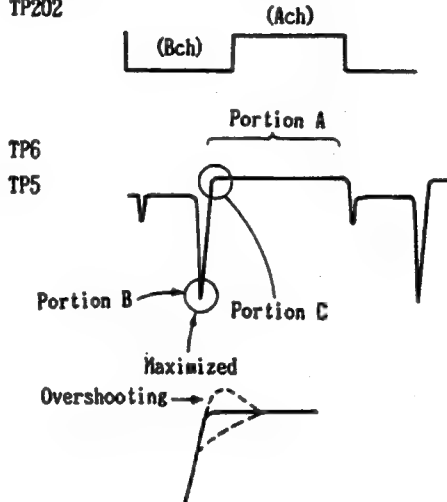
## 10-17-1. Bimorph Drive Waveform Amplitude Limit Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Remove the slip ring connector (CN661).</li> <li>Fully turn RV205 and RV206 on the DT-13 board fully counter-clockwise.</li> <li>Turn ON S201-Bit2 on the DT-13 board. Then, press S202 on the DT-13 board (D305 lights up). Adjust RV2 while D305 lights up.</li> <li>After adjustment is completed, set S201-Bit2 on the DT-13 board and connector CN661 of the slip ring to the former position.</li> </ul>	<p>CH-1: TP10/DT-15(A-1) CH-2: TP8/DT-15(A-1)</p> <p style="text-align: center;"> <math>A = +200 \pm \frac{2}{3} V</math>  <math>B = -200 \pm \frac{2}{3} V</math> </p>	<p>●RV2/DT-15(A-2)</p> <p style="text-align: right;">TRIG: TP8/DT-15(A-1)</p>

## 10-17-2. Distortion/Erasure Waveform Tentative Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Remove connector CN661 of the slip ring.</li> <li>Turn ON S201-Bit2 on the DT-13 board. Then, press S202 on the DT-13 board (D305 lights up). Adjust RV205 and RV206 while D305 lights up.</li> <li>After adjustment is completed, set S201-Bit2 on the DT-13 board to the former position.</li> <li>Insert connector CN661 of the slip ring.</li> </ul>	<p>CH-1: TP10/DT-15(A-1) CH-2: TP8/DT-15(A-1)</p>  <p><math>A = 200 \pm 10 \text{ V}_{p-p}</math></p>	<p>CH-A ●RV205/DT-13(A-9) CH-B ●RV206/DT-13(B-9)</p> <p>TRIG(+): TP8/DT-15(A-1)</p>

### 10-17-3. Strain Gage/Loop Gain Adjustment (CH-A)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Turn ON S1 on the DT-14P board and S201-Bit1 on the DT-13 board.</li> <li>• Set RV2 and RV3 on the DT-14P board as shown below.</li> </ul>  <ul style="list-style-type: none"> <li>• Play back a color-bar signal on alignment tape CR5-1B PS and put the unit into the JOG mode.</li> <li>• DT SELECT sw: VAR</li> </ul>	<p>CH-1: TP6/DT-14P (A-6) } ADD mode CH-2: TP5/DT-14P (INVERT) (B-5) }</p> <p>Step 1</p> <ul style="list-style-type: none"> <li>• Make horizontal at portion A using the CH-2 VARIABLE control of an oscilloscope.</li> </ul> <p>TP202</p>  <p>Step 2</p> <ul style="list-style-type: none"> <li>• Slowly turn the search dial so that the output at portion B is maximized.</li> <li>• Sharpen the sag level so that no overshoot appear at portion C.</li> </ul> <p>Repeat Steps 1 and 2, then check.</p>	<p>RV5/DT-14P (B-8)</p> <p>TRIG(-): TP202/DT-14P (D-7)</p>

# 10-17-4. Strain Gage/Loop Gain Adjustment (CH-B)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Turn ON S1 on the DT-14P board and S201-Bit1 on the DT-13 board.</li> <li>• Set RV2 and RV3 on the DT-14P board as shown in figure in Section 10-17-3.</li> <li>• Play back a color-bar signal on alignment tape CR5-1B PS and put the unit into the JOG mode.</li> <li>• DT SELECT sw: VAR</li> </ul>	<p>CH-1: TP7/DT-14P (A-8) } ADD mode CH-2: TP4/DT-14P (INVERT) (A-3) }</p> <p>Step 1</p> <ul style="list-style-type: none"> <li>• Make horizontal at portion A using the CH-2 VARIABLE control of an oscilloscope.</li> </ul> <p>TP202</p> <p>Step 2</p> <ul style="list-style-type: none"> <li>• Slowly turn the search dial so that the output at portion B is maximized.</li> <li>• Sharpen the sag level so that no overshoot appear at portion C.</li> </ul> <p>Repeat Steps 1 and 2, then check.</p>	<p>RV4/DT-14P (B-7)</p> <p>TRIG(+): TP202/DT-14P (D-7)</p>

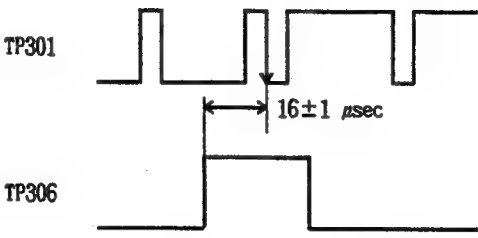
# 10-17-5. Drive Waveform Amplifier Gain Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>DT SELECT sw: VAR</li> <li>Play back a color-bar signal on alignment tape CR5-1B PS.</li> <li>Turn ON S1 on the DT-14P board and S201-Bit1 on the DT-13 board.</li> </ul> <p>After adjustment is completed, set S1 on the DT-14P board and S201-Bit1 on the DT-13 board to the former position.</p>	<p>TP10/DT-14P (C-1)</p>	<p>CH-B  RV2/DT-14P (A-4)  CH-A  RV3/DT-14P (B-5)</p> <p>TRIG: TP202/DT-14P (D-7)</p>

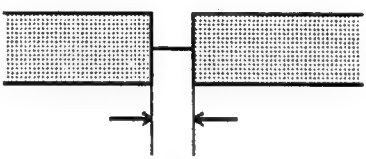
# 10-17-6. Sync Switching Pulse Position Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Turn ON S1 on the DT-14P board and S201-Bit1 on the DT-13 board.</li> <li>Play back a color-bar signal on alignment tape CR5-1B PS.</li> <li>DT SELECT sw: VAR</li> </ul> <p>After adjustment is completed, set S1 on the DT-14P board and S201-Bit1 on the DT-13 board to the former position.</p>	<p>CH-1: TP301/DT-14P (E-6)  CH-2: TP202/DT-14P (D-7)</p>	<p>When TRIG SLOPE is +: CH-A  RV201/SV-83B (D-2)</p> <p>When TRIG SLOPE is -: CH-B  RV202/SV-83B (D-2)</p> <p>TRIG (+/-):  TP202/DT-14P (D-7)</p>

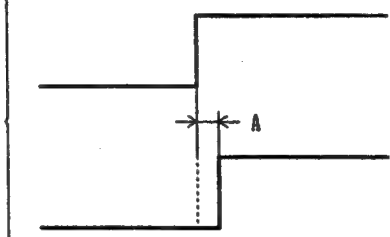

# 10-17-7. DT V Timing Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>DT SELECT sw: VAR</li> <li>Play back a color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>CH-1: TP301/DT-14P(E-6) CH-2: TP306/DT-14P(D-3)</p>  <p>TP301</p> <p>TP306</p> <p>16 ± 1 μsec</p>	<p>RV304/DT-14P(C-4)</p> <p>TRIG(+): TP306/DT-14P(D-3)</p>

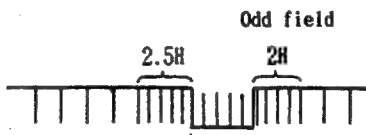
# 10-17-8. DT Head Y/C Switching Pulse Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>DT SELECT sw: VAR</li> <li>S1/DT-14P: ON</li> <li>Insert alignment tape CR2-1B PS and put the unit into the PLAY mode.</li> <li>Using a shorting clip, short between TP11 on the DT-14P board and GND.</li> <li>After adjustment is completed, set S1 on the DT-14P board to the former position. Remove the shorting clip.</li> </ul>	<p>TP205/DM-56P(B-1)</p>  <p>Minimize this gap. (20 μsec or less)</p> <p>Select the TRIG SLOPE (+/-).</p>	<p>RV203/DT-14P(C-5)</p> <p>TRIG: TP901/DM-56P(C-1)</p>

# 10-17-9. Anti-Rolling Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>DT SELECT sw: VAR</li> <li>Play back a color-bar signal on alignment tape CR5-1B PS and put the unit into the STILL mode.</li> <li>Using a shorting clip, short between TP305 on the DT-14P board and GND.</li> </ul>	<p>CH-1: TP308/DT-14P(D-5) CH-2: TP301/DT-14P(E-6)</p> <p>When it is shorted with ground</p>  <p>TP308</p> <p>When it is not shorted</p>  <p>TP301 (Sync)</p> <p>When removing the shorting clip, adjust to the same position as in shorting.</p> <p><math>A = 0 \pm 0.5 \text{ H}</math></p>	<p>RV305/DT-14P(D-5)</p> <p>TRIG: TP202/DT-14P(D-7)</p>


# 10-17-10. Drum Lock Phase Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>S101- Bit4/SV-82A: ON</li> <li>Short between TP11/DT-14P and GND with a shorting clip.</li> <li>Play back a color-bar signal on alignment tape CR5-2A PS.</li> </ul>	<p>TP201/SV-83A(C-1)</p> <p>Odd field</p>  <p>TP901/DM-56P(C-1)</p> <p>(A ch) (B ch)</p> <p><math>A = 2.25 \pm 0.1 \text{ H}</math> (<math>A = 144 \pm 6 \mu\text{sec}</math>)</p>	<p>RV202/SV-84P(C-1)</p> <p>TRIG: TP201/SV-83B(C-1)</p>

# 10-17-11. Distortion/Erasure Waveform Offset Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>MODE: EJECT</li> </ul>	TP10/DT-15(A-1) TP8/DT-15(A-1)  Each dc voltage should be within $0 \pm 0.5$ Vdc.	CH-A RV6/DT-14P(A-1) CH-B RV7/DT-14P(A-1)

# 10-17-12. Distortion/Erasure Waveform Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Turn ON S201-Bit2 on the DT-13 board and press S202 on the DT-13 board.</li> <li>After adjustment is completed, set S201-Bit2 on the DT-13 board to the former position.</li> </ul>	CH-1: TP10/DT-15(A-1) CH-2: TP8/DT-15(A-1)    $A = +190 \pm 5$ V $B = -190 \pm 5$ V  Note: RV should be turned slowly so that the value does not exceed 400 Vp-p.	CH-A RV205/DT-13(A-9) CH-B RV206/DT-13(B-9)         TRIG: TP8/DT-15(A-1)



## SECTION 11

### AUDIO/TIME CODE ALIGNMENT

#### 【Equipment Required】

- Audio oscillator
- Audio attenuator
- Vacuum voltmeter
- Spectrum analyzer
- Oscilloscope
- Level meter
- Alignment tapes CR8-1A PS, CR8-1B PS and CR5-1B PS

#### CR5-1B PS (8-960-096-91) Contents

TIME min,sec	VIDEO TRACK	AFM
0:00	RF Sweep Marker 1,2,4,6, 8,10,12 MHz	No-Signal
2:00		
5:00	60% H.Sweep (CTDM) Marker 0.5,1,2,3,4,5 MHz	
8:00	Pulse & Bar (CTDM)	
11:00	Multi Burst Y:0.5,1,2,4,5,5,5 MHz C:0.2,0.5,1,1.5,2 MHz	
	Pulse & Bar	400Hz Sine Wave 25kHz Deviation
14:00		
16:30	100% Color Bars	
17:00		75kHz Deviation
19:00	50% Bowtie & 10T	No-Signal
	Line 17A Signal	
22:00		
24:00	Quad Phase	
26:00	Flat Field	
28:00	100% Color Bars with Dropout	
30:00	Composite H.Sweep with VISC	

TIME min,sec	AUDIO TRACK	VIDEO TRACK	CTL TRACK
00:00	1 kHz OVU	Black Burst	CTL
02:30	Blank (only Bias)	Black Burst	CTL
03:00	15 kHz OVU	Black Burst	CTL
05:00	1 kHz -20VU	Black Burst	CTL
06:00	40 Hz -20VU 7 kHz -20VU 10 kHz -20VU 15 kHz -20VU	Black Burst	CTL
08:00			
10:00	1 kHz OVU	_____	1 kHz sine wave

## 【Switch Setting】

- Function Control Panel
  - CTL/TC/U-BIT switch : CTL
  - DT SELECT switch : VAR
- Level Control Panel
  - AUDIO MONITOR switch : ST/MIX
  - AUDIO MONITOR switch : LNG
  - REMOTE/LOCAL switch : LOCAL
- Subcontrol Panel
  - AUDIO MONITOR switch : ST
  - DOLBY NR switch : OFF
  - TBC CONTROL switch : LOCAL
  - VIDEO switch : PRESET
  - CHROMA switch : PRESET
  - BLACK LEVEL control switch : PRESET
  - Y/C DELAY switch : PRESET
  - CAPSTAN LOCK switch : 2FD
- Connector Panel
  - REF VIDEO 75Ω termination switch : ON

## 【Blank Tape】

The "Blank Tape" described in the adjustment item indicates the tape on which no video and audio signals are recorded.

## 【Audio System Adjustment Procedure】

For LNG audio system adjustment, make adjustments in the order of Sections 11-1 through 11-5.

For AFM audio system adjustment, make adjustments in the order of Sections 11-6 through 11-13.

## \* Item 900 Series

For setting, refer to the Setup in 1-7-1. To display this item, turn the SEARCH dial while pressing the PLAY button.

Note: Item 900 series are used only at the factory.

Setting should not be thus changed. When setting is changed, be sure to return it to the initial value.

# 11-1. DOLBY NR SKEWING ADJUSTMENT (Up to S/N 13694)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Short between TP301 and E303 on the AU-118P board with a shorting clip.</li> <li>• Supply a <math>1 \pm 0.1</math> kHz signal (<math>-26</math> dBs) to TP101/E301(CH-1) and TP201/E301(CH-2) on the AU-118P board.</li> <li>• DOLBY NR sw: ON</li> </ul>	CH-1: TP102/AU-118P(C-3) (GND: E101/AU-118P) CH-2: TP202/AU-118P(D-3) (GND: E201/AU-118P)  $-10 \pm 0.1$ dBs	Finely tune using an audio oscillator or attenuator.
<ul style="list-style-type: none"> <li>• DOLBY NR sw: ON</li> <li>• Supply a <math>17 \pm 0.05</math> kHz signal (<math>-26</math> dBs) to TP101/E301(CH-1) and TP201/E301(CH-2) on the AU-118P board.</li> <li>• After adjustment is completed, remove the shorting clip between TP301 and E303. Set the DOLBY NR switch to OFF.</li> </ul>	CH-1: TP102/AU-118P(C-3) (GND: E101/AU-118P) CH-2: TP202/AU-118P(D-3) (GND: E201/AU-118P)  $-18.3 \pm 0.1$ dBs	CH-1: ● LV101/AU-118P(C-3) CH-2: ● LV201/AU-118P(D-3)

## 11-2. PB FREQUENCY RESPONSE ADJUSTMENT (DOLBY OFF)

### 11-2-1. Oxide Tape PB Frequency Response Adjustment (Dolby OFF)

machine conditions for adjustment	specifications	adjustments																																																												
<ul style="list-style-type: none"><li>• DOLBY NR SW: OFF</li><li>• Play back 40Hz, 1kHz, 7kHz, 10kHz, and 15kHz signals on alignment tape CR8-1A PS.</li></ul>	<p>AUDIO OUT CH-1 connector (Terminated in 600 ohms.)</p> <p>AUDIO OUT CH-2 connector (Terminated in 600 ohms.)</p> <table><tr><th>Freq</th><th>Level</th></tr><tr><td>40Hz</td><td>Ref. <math>\pm</math> 1.7dB</td></tr><tr><td>1kHz</td><td>Ref.</td></tr><tr><td>7kHz</td><td>Ref. <math>\pm</math> 0.3dB</td></tr><tr><td>10kHz</td><td>Ref. <math>\pm</math> 0.3dB</td></tr><tr><td>15kHz</td><td>Ref. <math>\pm</math> 0.7dB</td></tr></table> <p>If the specification is not satisfied, set the switches as described below, then readjust.</p> <ul style="list-style-type: none"><li>• When the high-frequency level is higher than the specified value. Set and readjust the switches so that the level is lower.</li><li>• When the high-frequency level is lower than the specified value. Set and readjust the switches so that the level is higher.</li></ul> <p>High-frequency level goes low.      High-frequency level goes high.</p> <table><tr><td>Bit-4</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td></tr><tr><td>Bit-3</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr><tr><td>Bit-2</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td><td>0</td><td>0</td><td>1</td></tr><tr><td>Bit-1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>0</td><td>1</td><td>1</td></tr></table> <p style="text-align: right;">0:SW OFF 1:SW ON</p> <p style="text-align: center;">↑ Preset position</p>	Freq	Level	40Hz	Ref. $\pm$ 1.7dB	1kHz	Ref.	7kHz	Ref. $\pm$ 0.3dB	10kHz	Ref. $\pm$ 0.3dB	15kHz	Ref. $\pm$ 0.7dB	Bit-4	0	0	0	0	0	0	0	0	1	1	1	Bit-3	0	0	0	0	1	1	1	1	1	1	1	Bit-2	0	0	1	1	0	0	1	1	0	0	1	Bit-1	0	1	0	1	0	1	0	1	0	1	1	<ul style="list-style-type: none"><li>• 3kHz, 7kHz adjustment CH-1: RV111/AU-118P (B-5) CH-2: RV211/AU-118P (E-5)</li><li>• 10kHz, 15kHz adjustment CH-1: RV110/AU-118P (B-6) CH-2: RV210/AU-118P (E-6)</li></ul> <p>CH-1: S102/AU-118P (B-6) CH-2: S202/AU-118P (E-6)</p>
Freq	Level																																																													
40Hz	Ref. $\pm$ 1.7dB																																																													
1kHz	Ref.																																																													
7kHz	Ref. $\pm$ 0.3dB																																																													
10kHz	Ref. $\pm$ 0.3dB																																																													
15kHz	Ref. $\pm$ 0.7dB																																																													
Bit-4	0	0	0	0	0	0	0	0	1	1	1																																																			
Bit-3	0	0	0	0	1	1	1	1	1	1	1																																																			
Bit-2	0	0	1	1	0	0	1	1	0	0	1																																																			
Bit-1	0	1	0	1	0	1	0	1	0	1	1																																																			

Note: Setting of S102 and S202 on the AU-118P board should be the same position.

Note: Setting of S102 and S202 on the AU-118P board should be the same position.

11-2-2. Metal Tape PB Frequency Response Adjustment  
(Dolby OFF)

machine conditions for adjustment	specifications	adjustments								
<ul style="list-style-type: none"><li>• System setup menu *ITEM 901: 1</li><li>• DOLBY NR sw: OFF</li><li>• Play back 1kHz, 10kHz, and 15kHz signals on alignment tape CR8-1BPS.</li></ul>	<p>AUDIO OUT CH-1 connector (Terminated in 600 ohms.)</p> <p>AUDIO OUT CH-2 connector (Terminated in 600 ohms.)</p> <table><tr><th>Freq.</th><th>Level</th></tr><tr><td>1kHz</td><td>Ref.</td></tr><tr><td>10kHz</td><td>Ref. ± 0.3dB</td></tr><tr><td>15kHz</td><td>Ref. ± 0.7dB</td></tr></table>	Freq.	Level	1kHz	Ref.	10kHz	Ref. ± 0.3dB	15kHz	Ref. ± 0.7dB	<p>CH-1:</p> <p>RV114/AU-118P(A-5)</p> <p>CH-2:</p> <p>RV214/AU-118P(B-5)</p>
Freq.	Level									
1kHz	Ref.									
10kHz	Ref. ± 0.3dB									
15kHz	Ref. ± 0.7dB									
<ul style="list-style-type: none"><li>• After adjustment is completed, set system setup menu *ITEM 901 to "0".</li></ul>	<p>If the specification is not satisfied, perform Section 11-2-1. Oxide Tape PB Frequency Response Adjustment.</p>									

### 11-3. PB LEVEL ADJUSTMENT (Up to S/N 13694)

machine conditions for adjustment	specifications	adjustments
• Play back a 1kHz signal on alignment tape CR8-1B PS.	CH-1: TP102/AU-118P(C-3), E101/AU-118P(C-4) CH-2: TP202/AU-118P(D-3), E201/AU-118P(D-4)  -10 ± 0.2 dBs	CH-1: RV112/AU-118P(B-6) CH-2: RV212/AU-118P(D-6)
	CH-1: TP103/AU-118P(C-2), E102/AU-118P(A-1) CH-2: TP203/AU-118P(D-2), E202/AU-118P(E-1)  -10 ± 0.2 dBs	CH-1: RV102/BF-28A(A-4) (Panel display: CH-1 PB VR) CH-2: RV202/BF-28A(A-3) (Panel display: CH-2 PB VR)

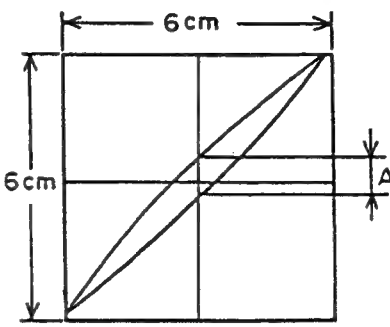
### PB LEVEL ADJUSTMENT (S/N 13695 and Higher)

machine conditions for adjustment	specifications	adjustments
• Play back a 1kHz signal on alignment tape CR8-1B PS.	CH-1: TP101(IC103)/AU-118P, E101/AU-118P(C-4) CH-2: TP201(IC103)/AU-118P, E201/AU-118P(D-4)  -10 ± 0.2 dBs	CH-1: RV112/AU-118P(B-6) CH-2: RV212/AU-118P(D-6)
	CH-1: TP103/AU-118P(C-2), E102/AU-118P(A-1) CH-2: TP203/AU-118P(D-2), E202/AU-118P(E-1)  -10 ± 0.2 dBs	CH-1: RV102/BF-28A(A-4) (Panel display: CH-1 PB VR) CH-2: RV202/BF-28A(A-3) (Panel display: CH-2 PB VR)

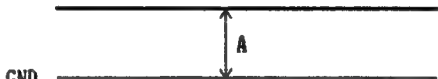
### 11-4. AUDIO OUTPUT LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
• Play back a 1kHz signal on alignment tape CR8-1B PS.	AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.)  +4 ± 0.1 dBm	CH-1: RV101/CP-161A(A-1) RV151/CP-111(B-2) CH-2: RV201/CP-161A(B-1) RV251/CP-111(B-1)

### 11-5. RP HEAD PHASE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 15 kHz signal on alignment tape CR8-1B PS.</li> <li>• Display the lissajous's wave-form.</li> </ul>	<p>AUDIO OUT CH-1 connector (Terminated in 600 ohms.) AUDIO OUT CH-2 connector (Terminated in 600 ohms.)</p>  <p><math>A \leq 0.52 \text{ cm (Within } \pm 5^\circ \text{)}</math></p>	<p>CH-1: ●RV113/AU-118P(C-5) CH-2 ●RV213/AU-118P(D-5)</p>

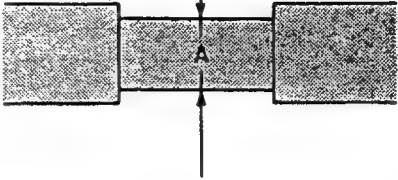

### 11-6. AFM DC LEVEL ADJUSTMENT (Up to S/N 11676)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS.</li> </ul>	<p>TP606/V0-18AP(F-3)</p>  <p><math>A = 0.35 \pm 0.02 \text{ Vdc}</math></p>	<p>●RV601/V0-18AP(F-3)</p>

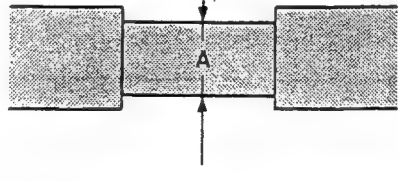
### 11-7. AFM CARRIER FREQUENCY ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Supply no signal to the AUDIO IN CH-3/CH-4 connector.</li> <li>• Insert the BCT-20M and put the unit into the REC mode.</li> <li>• CONNECTION: Fig. 6</li> <li>• Set S1 to ON.</li> <li>• After adjustment is completed, set S1 to OFF.</li> </ul>	<p>TP101/AFM-1A(E-2) TP103/AFM-1A(D-1) <math>310 \pm 0.5 \text{ kHz}</math></p>	<p>CH-3: ●RV101/AFM-1A(E-2) ●RV103/AFM-1A(D-3)</p>
	<p>TP201/AFM-1A(B-2) TP203/AFM-1A(B-3) <math>540 \pm 0.5 \text{ kHz}</math></p>	<p>CH-4: ●RV201/AFM-1A(A-2) ●RV203/AFM-1A(A-3)</p>

# 11-8. AFM RF LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS.</li> </ul>	<p>TP3/AFM-1A (CH-3) (D-1) TP4/AFM-1A (CH-4) (B-1)</p>  <p>Set the lower level in channel A or B to satisfy the specification.</p> <p><math>A = 1.5 \pm 0.05 \text{ Vp-p}</math></p>  <p>The waveform should not be clipped.</p>	<p>CH-3: RV2/AFM-1A (D-2) CH-4: RV4/AFM-1A (B-2)</p> <p>TRIG: TP701/AFM-1A (B-6)</p>

# 11-9. AFM DOC LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS.</li> </ul>	<p>TP5/AFM-1A (CH-3) (D-1) TP6/AFM-1A (CH-4) (B-2)</p>  <p>Set the lower level in channel A or B to satisfy the specification.</p> <p><math>A = 0.3 \pm 0.02 \text{ Vp-p}</math></p>	<p>CH-3: RV5/AFM-1A (D-1) CH-4: RV6/AFM-1A (B-2)</p> <p>TRIG: TP701/AFM-1A (B-6)</p>

# 11-10. SWITCHING NOISE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS.</li> </ul>	<p>AUDIO OUT CH-3 connector (Terminated in 600 ohms.) AUDIO OUT CH-4 connector (Terminated in 600 ohms.)</p> <p>Minimize the distortion factor. (0.5% or less)</p>	<p>CH-3: RV105/AFM-1A (B-4) CH-4: RV205/AFM-1A (B-4)</p>



### 11-11. AFM PB SNR OUTPUT LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS.</li> </ul>	TP303/AFM-1A(CH-3) (B-6) TP403/AFM-1A(CH-4) (E-5)  $-10 \pm 0.1 \text{ dBs}$	CH-3: ⌚RV102/AFM-1A(B-3) CH-4: ⌚RV202/AFM-1A(C-3)

### 11-12. AFM PB LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS.</li> </ul>	TP304/AFM-1A(B-6) C404(-)/AFM-1A(E-6)  $-10 \pm 0.1 \text{ dBs}$	CH-3: ⌚RV302/BF-28A(A-2) (Panel display: CH-3 PB VR) CH-4: ⌚RV402/BF-28A(A-1) (Panel display: CH-4 PB VR)

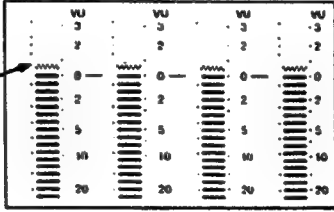
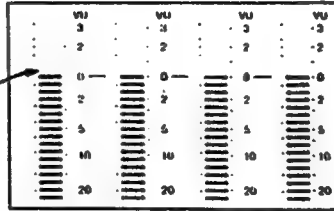
### 11-13. AFM AUDIO OUTPUT LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS.</li> </ul>	AUDIO OUT CH-3 connector (Terminated in 600 ohms.) AUDIO OUT CH-4 connector (Terminated in 600 ohms.)  $+4 \pm 0.1 \text{ dBm}$	CH-3: ⌚RV301/CP-161A(C-1) ⌚RV351/CP-111(D-2) CH-4: ⌚RV401/CP-161A(D-1) ⌚RV451/CP-111(D-1)

# 11-14. MONITOR OUT LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Set System Setup Item 103 to 1.</li> <li>Play back a 1kHz signal on alignment tape CR8-1B PS.</li> </ul>	AUDIO OUT CH-1/CH-3 connector (Terminated in 600 ohms.) AUDIO OUT CH-2/CH-4 connector (Terminated in 600 ohms.)	CH-1, CH-3: ⓈRV501/CP-161A(E-1) ⓈRV551/CP-111(F-2) CH-2, CH-4: ⓈRV601/CP-161A(F-1) ⓈRV651/CP-111(E-1)
<ul style="list-style-type: none"> <li>After adjustment is completed, set Item 103 to 0.</li> </ul>	$+4 \pm 0.1 \text{ dBm}$	

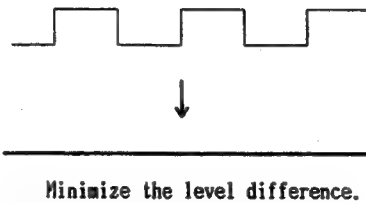
# 11-15. LEVEL METER 0VU ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a 1kHz signal on alignment tape CR8-1B PS and an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS.</li> <li>S1/DP-73(SCALE VU/dB select SW): VU (Located on the upper left.)</li> <li>Adjust the PB RV so that the value is +4.2dBs.</li> </ul>	 <p>The segment which is upper by one step than the display indicator's 0VU should blink.</p>	CH-1: ⓈRV501/BF-28A(I-3) CH-2: ⓈRV601/BF-28A(I-2) CH-3: ⓈRV701/BF-28A(I-2) CH-4: ⓈRV801/BF-28A(I-1)
<ul style="list-style-type: none"> <li>Set the output level to 4dBs.</li> </ul>	 <p>Up to the display indicator's 0VU lights, and the segment which is upper by one step should go off.</p>	CH-1: ⓈRV501/BF-28A(I-3) CH-2: ⓈRV601/BF-28A(I-2) CH-3: ⓈRV701/BF-28A(I-2) CH-4: ⓈRV801/BF-28A(I-1)
<ul style="list-style-type: none"> <li>After adjustment is completed, set S1 on the DP-73 board to the former position.</li> </ul>		

# 11-16. LOG AMP LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• S1/DP-73(SCALE VU/dB select SW): dB</li> </ul> <p>Step 1</p> <ul style="list-style-type: none"> <li>• Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS and adjust PB RV so that a 1kHz signal from the AUDIO OUT CH-3/CH-4 connector is <math>+13 \pm 0.1\text{dBs}</math>.</li> </ul>	Adjust so that the 0dB display indicator lights and no deviation occurs in CH-1 through CH-4.	RV902/BF-28A(H-5) (HIGH LEVEL)
<p>Step 2</p> <ul style="list-style-type: none"> <li>• Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS and adjust PB RV so that a 1kHz signal from the AUDIO OUT CH-3/CH-4 connector is <math>-17 \pm 0.1\text{dBs}</math>.</li> </ul>	Adjust so that the -30dB display indicator lights and no deviation occurs in CH-1 through CH-4.	RV903/BF-28A(H-4) (MIDDLE LEVEL)
<p>Step 3</p> <ul style="list-style-type: none"> <li>• Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS and adjust PB RV so that a 1kHz signal from the AUDIO OUT CH-3/CH-4 connector is <math>-27 \pm 0.1\text{dBs}</math>.</li> </ul>	Adjust so that the -40dB display indicator lights and no deviation occurs in CH-1 through CH-4.	RV901/BF-28A(H-4) (LOW LEVEL)
<p>Step 4</p> <ul style="list-style-type: none"> <li>• Play back an AFM 400Hz signal (25kHz deviation) on alignment tape CR5-1B PS and adjust PB RV so that a 1kHz signal from the AUDIO OUT CH-3/CH-4 connector is <math>+13 \pm 1\text{dBs}</math>.</li> <li>• After adjustment is completed, set S1 on the DP-73 board to the former position.</li> </ul>	<p>Check that the 0dB display indicator lights.</p> <p>Repeat the above Steps until the specification is satisfied.</p>	

# 11-17. LTC AMP OUT ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>• S101-Bit 2/SV-82A: ON</li> <li>• After adjustment is completed, set S101 on the SV-82A to OFF.</li> </ul>	CH-1: CN205,11B/TC-40AP } ADD mode CH-2: CN205,11C/TC-40AP }  Minimize the level difference.	●RV202/TC-40AP (D-2 or D-4)

# 11-18. LTC MUTING LEVEL ADJUSTMENT (Up to S/N 11424)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Turn on the power.</li> </ul>	TP206/TC-40AP (D-4 or F-5)  $300 \pm 20 \text{ mVdc}$	●RV201/TC-40AP (D-4 or F-5)

## SECTION 12

### VIDEO SYSTEM ALIGNMENT

#### 【Equipment Required】

- Dual-trace oscilloscope
- Spectrum analyzer
- PAL signal generator: Tektronix 1411 or the equivalent
- Waveform/vector monitor: Tektronix 1751 or the equivalent
- Vectorscope: Tektronix 521A or the equivalent
- Waveform monitor: Tektronix 1480 series or the equivalent
- Video Sweep Generator: Shibasoku 205A/2
- PAL component signal generator: Tektronix TSG-300 or the equivalent
- Sweep Generator: Shibasoku VS12CX or the equivalent
- Multi connector cable: J-6030-820-A

#### 【Switch Setting】

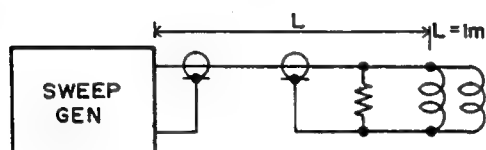
- Function Control Panel
  - CTL/TC/U-BIT switch : CTL
  - DT SELECT switch : VAR
- Control Panel
  - AUDIO MONITOR switch : ST/MIX
  - AUDIO MONITOR switch : LNG
  - REMOTE/LOCAL switch : LOCAL
- Subcontrol Panel
  - TBC CONTROL switch : LOCAL
  - VIDEO switch : PRESET
  - CHROMA switch : PRESET
  - BLACK LEVEL switch : PRESET
  - Y/C DELAY switch : PRESET
  - CAPSTAN LOCK switch : 2FD
  - AUDIO MONITOR switch : ST
  - DOLBY NR switch : OFF
- Connector Panel
  - REF VIDEO selector : AUTO
  - REF VIDEO 75 ohm termination : ON
- SY-64AP Board
  - VITC/AUTO/LTC switch : LTC
- SY-61A board
  - VTR CONTROL switch : INT
  - CHARACTER ON/OFF switch : ON

## 12-1. DM-56P BOARD ADJUSTMENT

### 12-1-1. Y-PB RF Frequency Response Adjustment

#### • Head coupling tool

To make this adjustment, stop the head drum rotation without a cassette tape and L-couple the sweep signal with the video head using two inductors (approx.  $100 \mu\text{H} \times 2$ ).



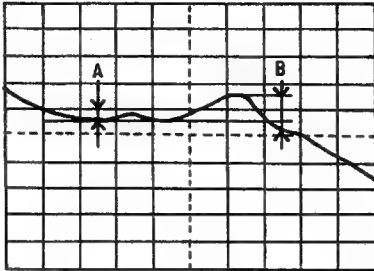
→ Put the inductors near the video head.

$75\Omega \pm 1\%$      $100 \mu\text{H} \pm 10\%$

Sweep signal range: 1 to 20 MHz

machine conditions for adjustment	specifications	adjustments
<b>Step 1</b> <ul style="list-style-type: none"> <li>Set the network analyzer output to -6dB.</li> <li>Fully turn RV1 and RV6 on the DM-56P board counterclockwise.</li> <li>Close the head coupling tool in the DT Y A channel head.</li> <li>Connect the network analyzer via an oscilloscope to CN110-6C on the DM-56P board.</li> </ul>	<b>CN110-6C/DM-56P(B-7)</b> <p> <math>A \leq 0.5 \text{ dB}</math>                      (Level difference between 2 MHz and 10 MHz)  <math>C \leq 10 \text{ nsec}</math>                      (Phase difference between 3 MHz and 12 MHz)  <math>B \leq 1 \text{ dB}</math>                      (Level difference between 2 MHz and 12 MHz)                 </p>	Variable resistor for CH-A/upper drum ●RV101/PA-78P
<b>Step 2</b> <ul style="list-style-type: none"> <li>Close the head coupling tool in the DT Y B channel head.</li> </ul>	<b>CN110-10C/DM-56P(B-7)</b> <p> <math>A \leq 0.5 \text{ dB}</math>                      (Level difference between 2 MHz and 10 MHz)  <math>C \leq 10 \text{ nsec}</math>                      (Phase difference between 3 MHz and 12 MHz)  <math>B \leq 1 \text{ dB}</math>                      (Level difference between 2 MHz and 12 MHz)                 </p>	Variable resistor for CH-B/upper drum ●RV301/PA-78P

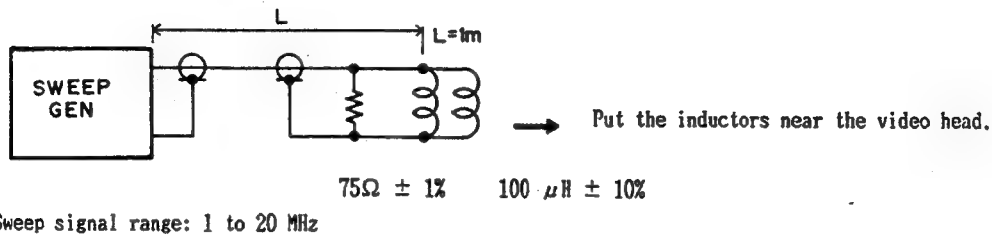
## 12-1-2. Y RF Phase Equalizer Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Set the network analyzer output to -6 to -16dB.</li> <li>Connect the network analyzer via an oscilloscope to TP104/DM-56P, and measure the group delay.</li> <li>Close the head coupling tool in the DT Y A channel head.</li> </ul>	<p>TP104/DM-56P(C-1)</p>  <p>2M 8M 10M 12M</p> <p>A = <math>0 \pm 5</math> nsec (Delay difference between 3 MHz and 10 MHz)</p> <p>B = <math>0 \pm 2\%</math> nsec (Delay difference between 8 MHz and 12 MHz)</p> <p>(RV15)</p>	<p>RV15/DM-56P(C-3)</p> <p>TRIG: TP901/DM-56P(C-1)</p>

### 12-1-3. C-PB RF Frequency Response Check

#### • Head coupling tool

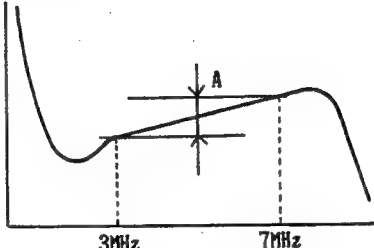
To make this adjustment, stop the head drum rotation without a cassette tape and L-couple the sweep signal with the video head using two inductors (approx.  $100 \mu\text{H} \times 2$ ).



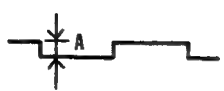
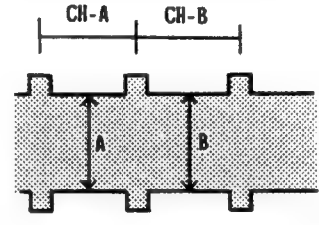
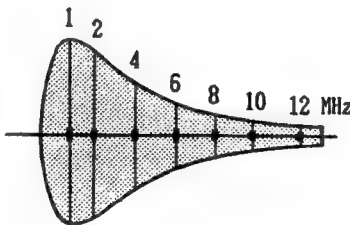
machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>Set the network analyzer output to -6 dB.</li> <li>Connect the network analyzer via oscilloscope to TP502 on the DM-56P board.</li> <li>Close the head coupling tool in the DT C A channel head.</li> </ul>	<p>TP502/DM-56P (F-1)</p> <p><math>A = 0 \pm 0.5 \text{ dB}</math> (Level difference between 3 MHz and 8 MHz)</p> <p><math>B \leq 10 \text{ nsec}</math> (Phase difference between 4 MHz and 10 MHz)</p>	
<p>Step 2</p> <ul style="list-style-type: none"> <li>Connect the network analyzer via oscilloscope to TP504 on the DM-56P board.</li> <li>Close the head coupling tool in the DT C B channel head.</li> </ul>	<p>TP504/DM-56P (F-1)</p> <p><math>A = 0 \pm 0.5 \text{ dB}</math> (Level difference between 3 MHz and 8 MHz)</p> <p><math>B \leq 10 \text{ nsec}</math> (Phase difference between 4 MHz and 10 MHz)</p>	



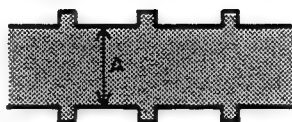
#### 12-1-4. C RF Phase Equalizer Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Set the network analyzer output to -6 to -16dB.</li> <li>• Connect the network analyzer via an oscilloscope to TP604/DM-56P, and adjust the group delay.</li> <li>• Close the head coupling tool in the R/P C A channel head.</li> </ul>	<p>TP604/DM-56P(H-1)</p>  <p style="text-align: center;"> <math>A \leq 15 \text{ nsec}</math>              (Phase difference between 3MHz and 7MHz.)         </p>	<p>RV1/DUS-269 on the DM-56P(G-2)</p>

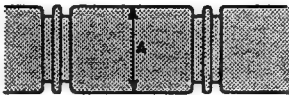
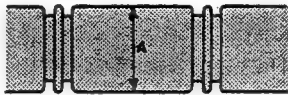
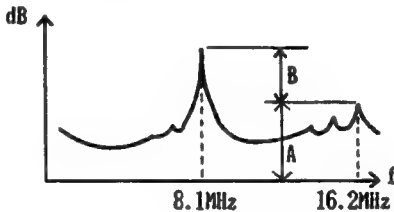
# 12-1-5. Y RF DC Level/Frequency Response Adjustment

machine conditions for adjustment	specifications	adjustments						
<p>Step 1</p> <p>• Play back the blank tape.</p>	<p>TP3/DM-56P (C-4)</p> <div></div> <p><math>A = 0 \pm 0.04 \text{ VDC}</math></p>	<p>RV4/DM-56P (C-5)</p> <p>TRIG: TP901/DM-56P (C-1)</p>						
<p>Step 2</p> <p>• Play back a flat field signal on alignment tape CR5-1B PS.</p>	<p>TP3/DM-56P (C-4)</p> <div></div> <p>Measured in the V center.</p> <p><math>A = B = 0.7 \pm 0.05 \text{ Vp-p}</math></p>	<p>CH-A:</p> <p>RV3/DM-56P (B-5)</p> <p>CH-B:</p> <p>RV8/DM-56P (C-5)</p> <p>TRIG: TP901/DM-56P (C-1)</p> <p>(+): CH-B</p> <p>(-): CH-A</p>						
<p>Step 3</p> <p>• Play back the V locked sweep signal on alignment tape CR5-1B PS.</p> <p>• S201-2/DT-13 : ON</p> <p>• S101-2/SV-82A: ON</p> <p>After adjustment is completed, set the following switches as follows:</p> <p>S201-2/DT-13 : OFF</p> <p>S101-2/SV-82A: OFF</p>	<p>TP3/DM-56P (C-4)</p> <div></div> <p>Check the frequency response.</p> <table><thead><tr><th>Freq.</th><th>Level</th></tr></thead><tbody><tr><td>6 MHz</td><td>100%</td></tr><tr><td>12 MHz</td><td>12% or more</td></tr></tbody></table>	Freq.	Level	6 MHz	100%	12 MHz	12% or more	<p>TRIG: TP901/DM-56P (C-1)</p>
Freq.	Level							
6 MHz	100%							
12 MHz	12% or more							

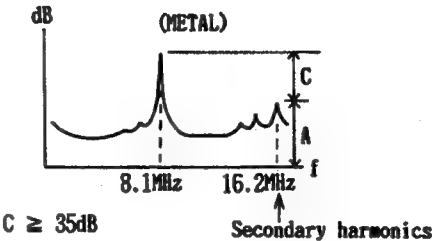
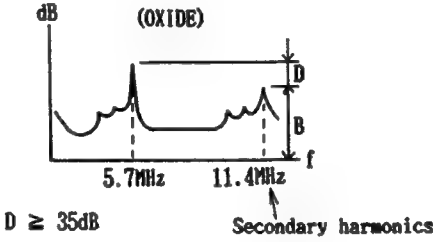
### 12-1-6. Y RF AGC Output Level Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a flat field signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP101/DM-56P(A-2)</p>  <p>Measured in the V center.</p> <p><math>A = 1.0 \pm 0.04 \text{ Vp-p}</math></p>	<p>RV101/DM-56P(A-2)</p> <p>TRIG: TP901/DM-56P(C-1)</p>

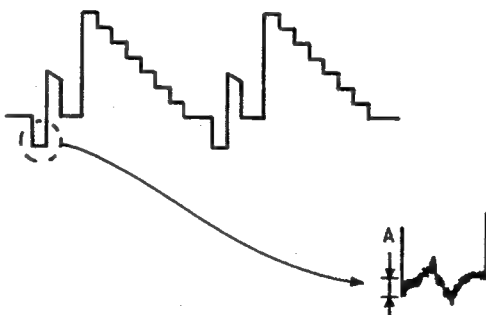
# 12-1-7. Y HF Input Level/Balance Adjustment

machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>Play back a flat field signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP104/DM-56P(C-1)</p>  <p>Measured in the V center.  <math>A = 150 \pm 20 \text{ mVp-p}</math></p>	<p>RV103/DM-56P(B-2)</p> <p>TRIG: TP901/DM-56P(C-1)</p>
<p>Step 2</p> <ul style="list-style-type: none"> <li>Play back a Pulse &amp; bar signal on alignment tape CR5-2A PS.</li> </ul>	<p>TP104/DM-56P(C-1)</p>  <p>Measured in the V center.  <math>A = 150 \pm 20 \text{ mVp-p}</math></p>	<p>RV102/DM-56P(B-1)</p> <p>TRIG: TP901/DM-56P(C-1)</p>
<p>Step 3</p> <ul style="list-style-type: none"> <li>Play back a flat field signal on alignment tape CR5-1B PS.</li> <li>Connect the spectrum analyzer via oscilloscope to TP105 on the DM-56P board.</li> </ul>	<p>TP105/DM-56P(D-1)</p>  <p>Minimize A level.  <math>(B \geq 40 \text{ dB})</math></p>	<p>RV104/DM-56P(C-1)</p>

# 12-1-8. Y Limiter Balance Adjustment

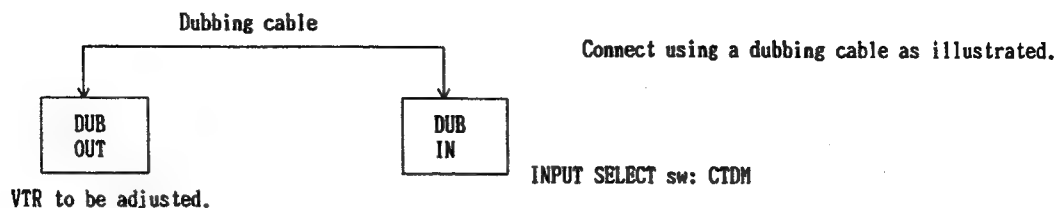
machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>• Play back a flat field signal on alignment tape CR5-1B PS.</li> <li>• Connect the spectrum analyzer via oscilloscope to TP301 on the DM-56P board.</li> </ul>	<p>TP301/DM-56P (E-1)</p>  <p><math>C \geq 35\text{dB}</math></p> <p>A = minimize</p>	<p>RV301/DM-56P (D-1)</p>
<p>Step 2</p> <ul style="list-style-type: none"> <li>• Play back a Pulse &amp; bar signal on alignment tape CR5-2A PS.</li> </ul>	 <p><math>D \geq 35\text{dB}</math></p> <p>B = minimize</p>	<p>TRIG: TP301/DM-56P (E-1)</p>

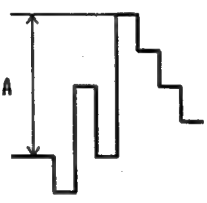
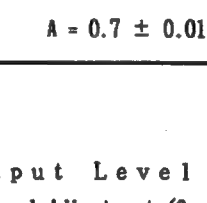
# 12-1-9. Y Demodulator Balance Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Set RV106 and RV107 on the DM-56P to the mechanical center.</li> <li>• Play back a color-bar signal on alignment tape CR5-2A PS.</li> </ul>	<p>TP402/DM-56P (E-6)</p>  <p>Minimize the carrier leak.</p> <p><math>(A \leq 50 \text{ mVp-p})</math></p>	<p>RV302/DM-56P (E-1)</p> <p>TRIG: TP401/DM-56P (E-6)</p>

## 12-1-10. Y DUB OUT Level Adjustment

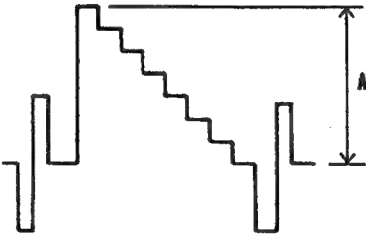
### [Connection]





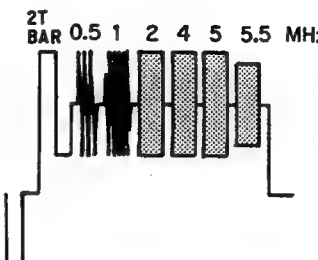
machine conditions for adjustment	specifications	adjustments
<b>Step 1</b> <ul style="list-style-type: none"> <li>Connect the DUB OUT and DUB IN connectors using a dubbing cable.</li> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<b>TP408/DM-56P (D-7)</b>  <p style="text-align: center;"><math>A = 0.7 \pm 0.01 \text{ Vp-p}</math></p>	<b>RV305/DM-56P (D-5)</b>
<b>Step 2</b> <ul style="list-style-type: none"> <li>Connect as in Step 1 and play back a color-bar signal on alignment tape CR5-2A PS.</li> </ul>	 <p style="text-align: center;"><math>A = 0.7 \pm 0.01 \text{ Vp-p}</math></p>	<b>RV304/DM-56P (D-4)</b>

## 12-1-11. Y Demodulator Output Level Adjustment

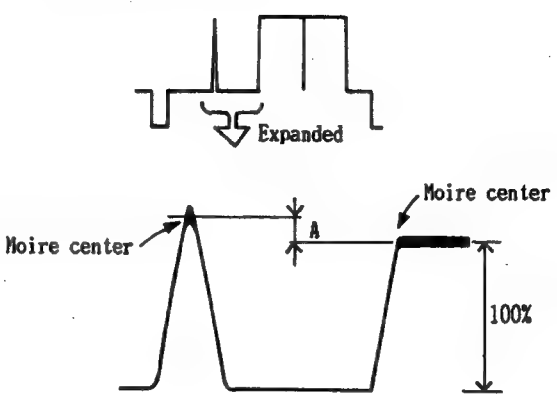
\* Before perform this adjustment, the Y DUB OUT Level Adjustment (Section 12-1-10) should be completed.

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<b>TP402/DM-56P (E-6)</b>  <p style="text-align: center;"><math>A = 0.7 \pm 0.01 \text{ Vp-p}</math></p>	<b>RV401/DM-56P (E-6)</b> <p style="text-align: right;">TRIG: TP402/DM-56P (E-6)</p>

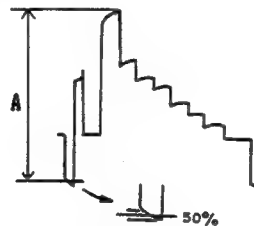
# 12-1-12. Y Video Frequency Response Adjustment

machine conditions for adjustment	specifications	adjustments																
<p>Step 1</p> <ul style="list-style-type: none"><li>• Play back a multi burst signal on alignment tape CR5-1B PS.</li><li>• Set RV107 and RV106 on the DM-56P board as follows:</li></ul> <div><div><p>RV107</p></div><div><p>RV106</p></div></div> <ul style="list-style-type: none"><li>• Push 1 + 3 on the WFM (For CH-A).</li><li>• Push 2 + 4 on the WFM (For CH-B).</li></ul>	<p>TP401/DM-56P (E-6)</p>  <p>Observe the level of the waveform in the moire center.</p> <table><tr><th>Freq.</th><th>Level</th></tr><tr><td>2T bar</td><td>100% (Ref.)</td></tr><tr><td>0.5MHz</td><td>100 ± 4%</td></tr><tr><td>1 MHz</td><td>100 ± 4%</td></tr><tr><td>2 MHz</td><td>100 ± 4%</td></tr><tr><td>4 MHz</td><td>100 ± 4%</td></tr><tr><td>5 MHz</td><td>98 ± 4%</td></tr><tr><td>5.5MHz</td><td>75% or more</td></tr></table>	Freq.	Level	2T bar	100% (Ref.)	0.5MHz	100 ± 4%	1 MHz	100 ± 4%	2 MHz	100 ± 4%	4 MHz	100 ± 4%	5 MHz	98 ± 4%	5.5MHz	75% or more	<p>CH-A: RV3/EQ-26/DM-56P (B-5)</p> <p>CH-B: RV4/EQ-26/DM-56P (C-5)</p>   <
Freq.	Level																	
2T bar	100% (Ref.)																	
0.5MHz	100 ± 4%																	
1 MHz	100 ± 4%																	
2 MHz	100 ± 4%																	
4 MHz	100 ± 4%																	
5 MHz	98 ± 4%																	
5.5MHz	75% or more																	

### 12-1-13. Y HF Gain Adjustment

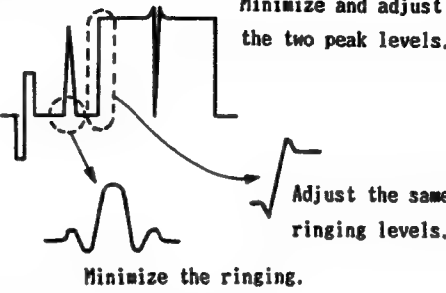

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a pulse &amp; bar (CTDM) signal on alignment tape CR5-1B PS.</li> <li>• Observe TP101 on the TBC-7P, 7D, 7E board using an waveform monitor.</li> <li>• Press the FIELD 1+3 on the waveform monitor and adjust the waveform in CH A using RV1 on the DM-56P board.</li> <li>• Press the FIELD 2+4 on the waveform monitor and adjust the waveform in CH B using RV6 on the DM-56P board.</li> <li>• Eject the tape.</li> </ul>	<p>TP101/TBC-7P, 7D, 7E (G-2)</p>  <p><math>A = 3 \pm 1\%</math></p>	<ul style="list-style-type: none"> <li>●RV1/DM-56P (B-7)</li> <li>●RV6/DM-56P (C-7)</li> </ul>

### 12-1-14. Y FF Level Adjustment

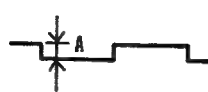
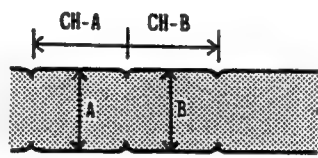
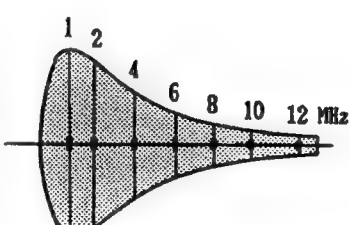
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>• MODE: <math>\times 15</math> SEARCH</li> </ul>	<p>TP401/DM-56P (E-6)</p>  <p><math>A = 1.5 \pm 0.04 V_{p-p}</math></p>	<ul style="list-style-type: none"> <li>●RV303/DM-56P (E-4)</li> </ul> <p>TRIG: TP401/DM-56P (E-6)</p>




# 12-1-15. Y DT BIDIREX Output Adjustment

machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>• S901/DM-56P: ON</li> <li>• Play back a pulse &amp; bar signal on the alignment tape (recorded by a composite signal) and put the unit into the STILL mode.</li> </ul>	<p>TP402/DM-56P (E-6)</p>  <p>Minimize and adjust the two peak levels.</p> <p>Adjust the same ringing levels.</p> <p>Minimize the ringing.</p>	<ul style="list-style-type: none"> <li>●RV306/DM-56P (E-5)</li> <li>●RV307/DM-56P (E-5)</li> </ul> <p>Adjust alternately.</p>
<p>Step 2</p> <ul style="list-style-type: none"> <li>• S901/DM-56P: ON</li> <li>• Play back a pulse &amp; bar signal on alignment tape CR5-1B PS and put the unit into the STILL mode.</li> </ul>	<p>TP402/DM-56P (E-6)</p>  <p><math>A = 0.7 \pm 0.04 \text{ Vp-p}</math></p>	<ul style="list-style-type: none"> <li>●RV308/DM-56P (F-5)</li> </ul>



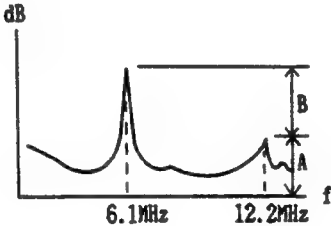
# 12-1-16. C RF DC Level Adjustment

machine conditions for adjustment	specifications	adjustments						
<p>Step 1</p> <ul style="list-style-type: none"><li>• Play back a blank tape.</li></ul>	<p>TP505/DM-56P (H-4)</p> <div></div> <p><math>A = 0 \pm 0.04 \text{ Vdc}</math></p>	<p>RV503/DM-56P (H-5)</p>						
<p>Step 2</p> <ul style="list-style-type: none"><li>• Play back a flat field signal on alignment tape CR5-1B PS.</li><li>• Turn RV102 on the SV-82A board so that the output waveform is maximized.</li></ul>	<p>TP505/DM-56P (H-4)</p> <div></div> <p>Measured in the V center.</p> <p><math>A = B = 0.6 \pm 0.05 \text{ Vp-p}</math></p>	<p>CH-A: RV502/DM-56P (G-5)</p> <p>CH-B: RV505/DM-56P (H-5)</p> <p>TRIG: TP901/DM-56P (C-1) (+): CH-B (-): CH-A</p>						
<p>Step 3</p> <ul style="list-style-type: none"><li>• Set the switches as follows: S1/SV-83B : ON S201-2/DT-13 : ON S101-2/SV-82A: ON</li><li>• Play back a V locked sweep signal on alignment tape, CR5-1B PS.</li><li>• Turn RV102 on the SV-82A board so that the output waveform is maximized.</li></ul> <p>After adjustment is completed, set the following switches as follows: S1/SV-83B: OFF S201-2/DT-13 : OFF S101-2/SV-82A: OFF</p>	<p>TP505/DM-56P (H-4)</p> <div></div> <p>Check the frequency response.</p> <table><tr><th>Freq.</th><th>Level</th></tr><tr><td>4 MHz</td><td>100% (Ref.)</td></tr><tr><td>10 MHz</td><td>12% or more</td></tr></table>	Freq.	Level	4 MHz	100% (Ref.)	10 MHz	12% or more	<p>TRIG: TP902/DM-56P (F-1)</p>
Freq.	Level							
4 MHz	100% (Ref.)							
10 MHz	12% or more							

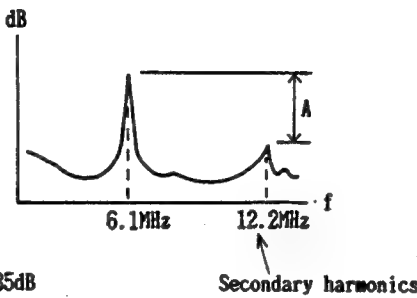
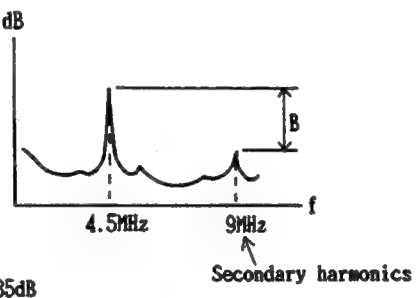
# 12-1-17. C RF AGC Output Level Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a flat field signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP508/DM-56P (F-1)</p>  <p>Measured in the V center.</p> <p><math>A = 1.0 \pm 0.04 \text{ Vp-p}</math></p>	<p>RV512/DM-56P (F-1)</p> <p>TRIG: TP901/DM-56P (C-1)</p>

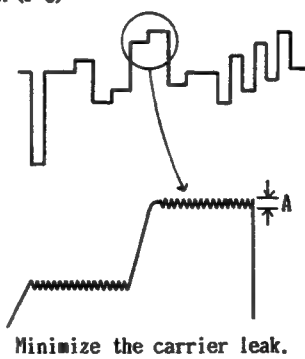
# 12-1-18. C HF Input Level/Balance Adjustment

machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>Play back a flat field signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP604/DM-56P (H-1)</p>  <p>Measured in the V center.  <math>A = 200 \pm 20 \text{ mVp-p}</math></p>	<p>TRIG: TP902/DM-56P (F-1)</p>
<p>Step 2</p> <ul style="list-style-type: none"> <li>Play back a Pulse &amp; bar signal on alignment tape CR5-2A PS.</li> </ul>	<p>TP604/DM-56P (H-1)</p>  <p>Measured in the V center.  <math>A = 300 \pm 20 \text{ mVp-p}</math></p>	<p>RV606/DM-56P (G-1)</p> <p>TRIG: TP902/DM-56P (F-1)</p>
<p>Step 3</p> <ul style="list-style-type: none"> <li>Play back a flat field signal on alignment tape CR5-1B PS.</li> <li>Connect the spectrum analyzer via oscilloscope to TP605 on the DM-56P board.</li> </ul>	<p>TP605/DM-56P (J-1)</p>  <p>Minimize A level.  <math>(B \geq 40 \text{ dB})</math></p>	<p>RV605/DM-56P (H-1)</p>

# 12-1-19. C Limiter Balance Adjustment

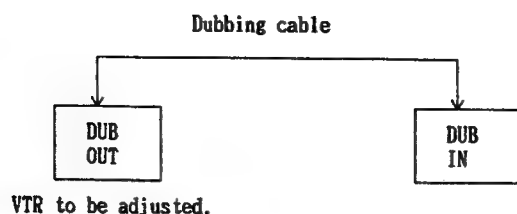
machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>Play back a flat field signal on alignment tape CR5-1B PS.</li> <li>Connect the spectrum analyzer via oscilloscope to TP708 on the DM-56P board.</li> </ul>	<p>TP708/DM-56P (H-2)</p> <p>(METAL)</p>  <p><math>A \geq 35\text{dB}</math></p> <p>Secondary harmonics</p>	<p>RV701/DM-56P (G-1)</p>
<p>Step 2</p> <ul style="list-style-type: none"> <li>Play back a Pulse &amp; bar signal on alignment tape CR5-2A PS.</li> </ul>	<p>(OXIDE)</p>  <p><math>B \geq 35\text{dB}</math></p> <p>Secondary harmonics</p>	

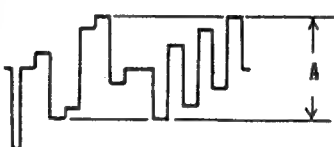
# 12-1-20. C Demodulator Balance Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a color-bar signal on alignment tape CR5-2A PS.</li> </ul>	<p>TP801/DM-56P (J-6)</p>  <p>Minimize the carrier leak.</p> <p><math>A \leq 50\text{ mVp-p}</math></p>	<p>RV702/DM-56P (J-1)</p> <p>TRIG: TP801/DM-56P (J-6)</p>

## 12-1-21. C DUB OUT Level Adjustment

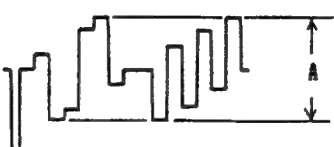
【Connection】



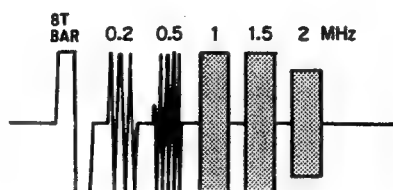
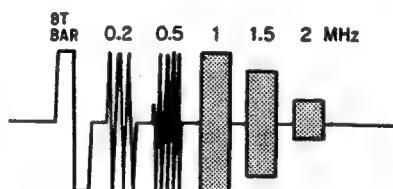
machine conditions for adjustment	specifications	adjustments
<b>Step 1</b> <ul style="list-style-type: none"> <li>Connect DUB OUT and DUB IN connectors using a dubbing cable.</li> <li>Play back a color-bar signal on alignment tape CR5-1B PS.</li> </ul>	TP804/DM-56P (J-6)  $A = 0.78 \pm 0.01 \text{ Vp-p}$	●RV703/DM-56P (J-3)  TRIG: TP804/DM-56P (J-6)
<b>Step 2</b> <ul style="list-style-type: none"> <li>Play back a color-bar signal on alignment tape CR5-2A PS.</li> <li>After adjustment is completed, remove the dubbing cable.</li> </ul>	$A = 0.59 \pm 0.01 \text{ Vp-p}$	●RV704/DM-56P (J-3)

## 12-1-22. C Demodulator Output Level Adjustment

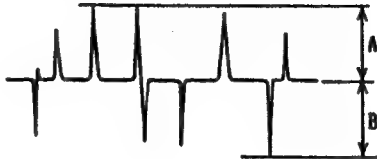
\* Before perform this adjustment, the C DUB OUT Level Adjustment (Section 12-1-21) should be completed.

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	TP802/DM-56P (H-5)  $A = 0.93 \pm 0.01 \text{ Vp-p}$	●RV802/DM-56P (J-6)  TRIG: TP802/DM-56P (H-5)

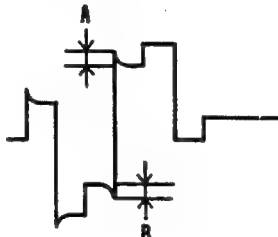
# 12-1-23. C Video Frequency Response Adjustment

machine conditions for adjustment	specifications	adjustments														
<p>Step 1</p> <ul style="list-style-type: none"><li>• Play back a multi burst signal on alignment tape CR5-1B PS.</li><li>• Push 1 + 3 on the WFM (For CH-A).</li><li>• Push 2 + 4 on the WFM (For CH-B).</li></ul>	<p>COMPONENT 2 R-Y OUT (Terminated in 75 ohms.)</p>  <p>Observe the level of the waveform in the moire center.</p> <table><tr><th>Freq.</th><th>Level</th></tr><tr><td>8T bar</td><td>100% (Ref.)</td></tr><tr><td>0.2MHz</td><td>100 ± 4 %</td></tr><tr><td>0.5MHz</td><td>100 ± 4 %</td></tr><tr><td>1.0MHz</td><td>100 ± 4 %</td></tr><tr><td>1.5MHz</td><td>100 ± 4 %</td></tr><tr><td>2.0MHz</td><td>75% or more</td></tr></table>	Freq.	Level	8T bar	100% (Ref.)	0.2MHz	100 ± 4 %	0.5MHz	100 ± 4 %	1.0MHz	100 ± 4 %	1.5MHz	100 ± 4 %	2.0MHz	75% or more	<p>CH-A: RV3/EQ-28/DM-56P (H-4)</p> <p>CH-B: RV4/EQ-28/DM-56P (H-4)</p> <p>TRIG: COMPONENT 2 Y OUT</p>
Freq.	Level															
8T bar	100% (Ref.)															
0.2MHz	100 ± 4 %															
0.5MHz	100 ± 4 %															
1.0MHz	100 ± 4 %															
1.5MHz	100 ± 4 %															
2.0MHz	75% or more															
<p>Step 2</p> <ul style="list-style-type: none"><li>• Play back a multi burst signal on alignment tape CR5-2A PS.</li></ul>	<p>TP401/TBC-7P,7D,7E(C-2)</p>  <p>Observe the level of the waveform in the moire center.</p> <table><tr><th>Freq.</th><th>Level</th></tr><tr><td>0.2MHz</td><td>100% (Ref.)</td></tr><tr><td>0.5MHz</td><td>100 ± 5%</td></tr><tr><td>1 MHz</td><td>100 ± 5%</td></tr><tr><td>1.5MHz</td><td>85 ± 10%</td></tr></table>	Freq.	Level	0.2MHz	100% (Ref.)	0.5MHz	100 ± 5%	1 MHz	100 ± 5%	1.5MHz	85 ± 10%	<p>CH-A: RV7/EQ-28/DM-56P (G-4)</p> <p>CH-B: RV8/EQ-28/DM-56P (G-4)</p> <p>TRIG: TP901/DM-56P (C-1)</p>				
Freq.	Level															
0.2MHz	100% (Ref.)															
0.5MHz	100 ± 5%															
1 MHz	100 ± 5%															
1.5MHz	85 ± 10%															

# 12-1-24. Y Noise Canceller Adjustment

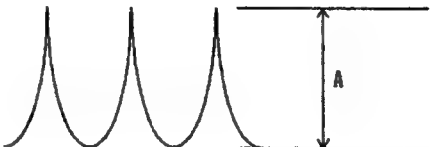
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a pulse &amp; bar signal on alignment tape CR5-2A PS.</li> </ul>	TP405/DM-56P (E-6)  $A = B$	RV405/DM-56P (F-6)  TRIG: 1411 SYNC HD

# 12-1-25. C Metal PB Waveform Equalizer Adjustment

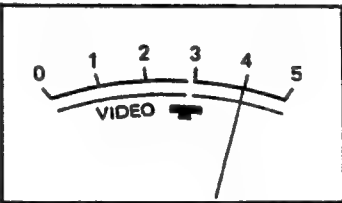
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	COMPONENT 2 R-Y OUT (at WFM)  $A = B$	RV801/DM-56P (J-5)  TRIG: COMPONENT 2 Y OUT



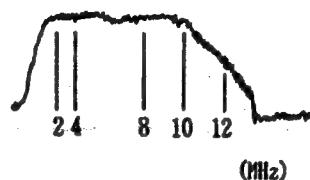
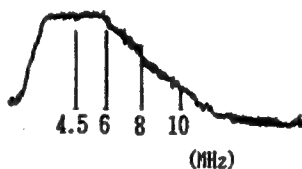
### 12-1-26. Y RF Envelope Adjustment


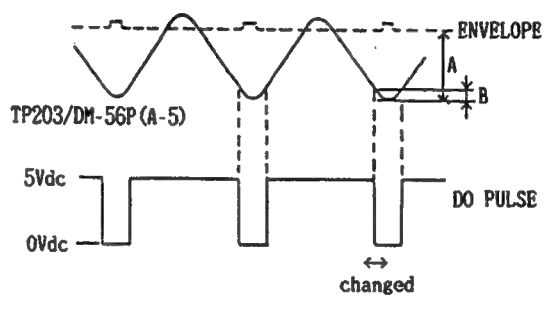

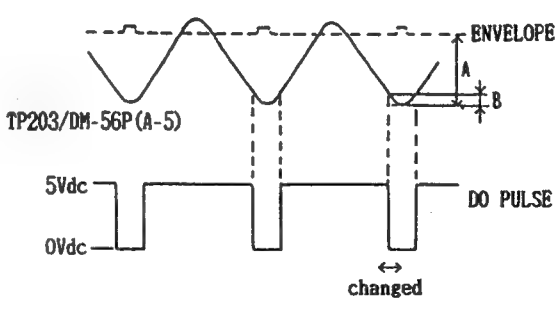
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• S101-2/SV-82A: ON</li> <li>• S201-2/DT-13 : ON</li> <li>• Play back a flat field signal on alignment tape CR5-1B PS.</li> <li>• Put the unit into the SEARCH STILL mode.</li> <li>• Put the unit into JOG mode, and turn search dial so that the output waveform is maximized.</li> <li>• After this adjustment is completed, set the following switches as follows:</li> <li>• S101-2/SV-82A: OFF</li> <li>• S201-2/DT-13 : OFF</li> </ul>	<p>TP206/DM-56P (C-4)</p>  <p><math>A = 0.6 \pm 0.1 \text{ Vp-p}</math></p>	<p>RV207/DM-56P (C-3)</p> <p>TRIG: TP206/DM-56P (C-4)</p>

### 12-1-27. RF Meter Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a flat field signal on alignment tape CR5-1B PS.</li> </ul>	<p>VIDEO RF meter/front panel</p>  <p>Set the pointer to 4.</p>	<p>RV206/DM-56P (A-6)</p>

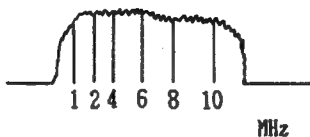

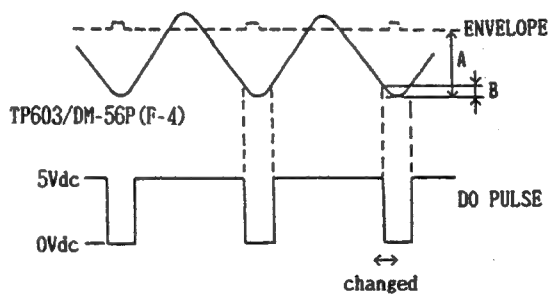
# 12-1-28. Y DOC Sensitivity Adjustment

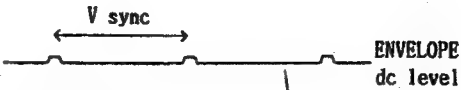
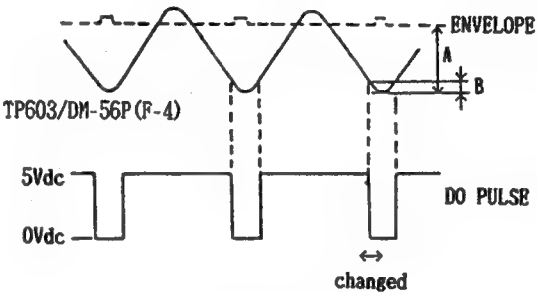
machine conditions for adjustment	specifications	adjustments												
<p>Step 1-1</p> <ul style="list-style-type: none"><li>• Play back a RF sweep signal on alignment tape CR5-1B PS.</li><li>• S1/SV-83B: ON</li><li>• S101-Bit4/SV-82A: ON</li><li>• S201-Bit2/DT-13: ON</li><li>• Turn the TRACKING control so that the output waveform around 6 through 7 MHz is maximized.</li></ul>	<p>TP202/DM-56P (A-4) (METAL)</p>  <p style="text-align: center;">(MHz)</p> <p>CH-A/CH-B</p> <table><tr><th>Freq.</th><th>LEVEL</th></tr><tr><td>2 MHz</td><td>100 ± 15 %</td></tr><tr><td>4 MHz</td><td>100 ± 15 %</td></tr><tr><td>8 MHz</td><td>100 % (Ref.)</td></tr><tr><td>10 MHz</td><td>100 ± 15 %</td></tr><tr><td>12 MHz</td><td>60 ± 15 %</td></tr></table>	Freq.	LEVEL	2 MHz	100 ± 15 %	4 MHz	100 ± 15 %	8 MHz	100 % (Ref.)	10 MHz	100 ± 15 %	12 MHz	60 ± 15 %	<p>RV201/DM-56P (A-3) (Low range)</p> <p>RV202/DM-56P (A-3) (High range)</p>
Freq.	LEVEL													
2 MHz	100 ± 15 %													
4 MHz	100 ± 15 %													
8 MHz	100 % (Ref.)													
10 MHz	100 ± 15 %													
12 MHz	60 ± 15 %													
<p>Step 1-2</p> <ul style="list-style-type: none"><li>• Play back a RF sweep signal on alignment tape CR5-2A PS.</li></ul> <p>• After adjustment is completed, return the above switches to former position.</p>	<p>(OXIDE)</p>  <p style="text-align: center;">(MHz)</p> <p>CH-A/CH-B</p> <table><tr><th>Freq.</th><th>LEVEL</th></tr><tr><td>4.5MHz</td><td>100 ± 15 %</td></tr><tr><td>6 MHz</td><td>100 % (Ref.)</td></tr><tr><td>8 MHz</td><td>80 ± 20 %</td></tr><tr><td>10 MHz</td><td>30 ± 15 %</td></tr></table>	Freq.	LEVEL	4.5MHz	100 ± 15 %	6 MHz	100 % (Ref.)	8 MHz	80 ± 20 %	10 MHz	30 ± 15 %	<p>CV1/DUS-288 on the DM-56P board.</p> <p>TRIG: TP901/DM-56P (C-1) (-): CH-A (+): CH-B</p>		
Freq.	LEVEL													
4.5MHz	100 ± 15 %													
6 MHz	100 % (Ref.)													
8 MHz	80 ± 20 %													
10 MHz	30 ± 15 %													

<p>Step 2</p> <ul style="list-style-type: none"> <li>• Play back a pulse &amp; bar signal on alignment tape CR5-2A PS.</li> </ul>	<p>TP202/DM-56P (A-4)</p> 	<p>Maximize the DC level using a TRACKING control.</p>
<p>Step 3</p> <ul style="list-style-type: none"> <li>• MODE: JOG STILL</li> </ul>	<p>TP202/DM-56P (A-4)</p>  <p><math>B/A = 20 \pm 2\%</math></p>	<p>RV203/DM-56P (A-4)</p> <p>TRIG: TP404/DM-56P (E-6)</p>
<p>Step 4</p> <ul style="list-style-type: none"> <li>• Play back a flat field signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP202/DM-56P (A-4)</p> 	<p>Maximize the DC level using a TRACKING control.</p>
<p>Step 5</p> <ul style="list-style-type: none"> <li>• MODE: JOG STILL</li> </ul>	<p>TP202/DM-56P (A-4)</p>  <p><math>B/A = 16 \pm 2\%</math></p>	<p>RV204/DM-56P (B-5)</p> <p>TRIG: TP404/DM-56P (E-6)</p>

<p>Step 6</p> <ul style="list-style-type: none"> <li>• Check that no white noise appears near the guard band on a monitor.</li> </ul>		
<p>Step 7</p> <ul style="list-style-type: none"> <li>• Play back a color-bar with dropout signal on alignment tape CR5-1B PS.</li> </ul>	<p>Check that the dropout portion is compensated on the monitor.</p>	
<p>Step 8</p> <ul style="list-style-type: none"> <li>• Play back a color-bar signal on alignment tape CR5-2A PS.</li> <li>• MODE: FWD <math>\times 24</math>.</li> </ul>	<p>If the play back picture cannot recognize with color-bar signal, perform adjustment so that recognize with the color-bar signal.</p>	<p>RV205/DM-56P (A-5)</p>

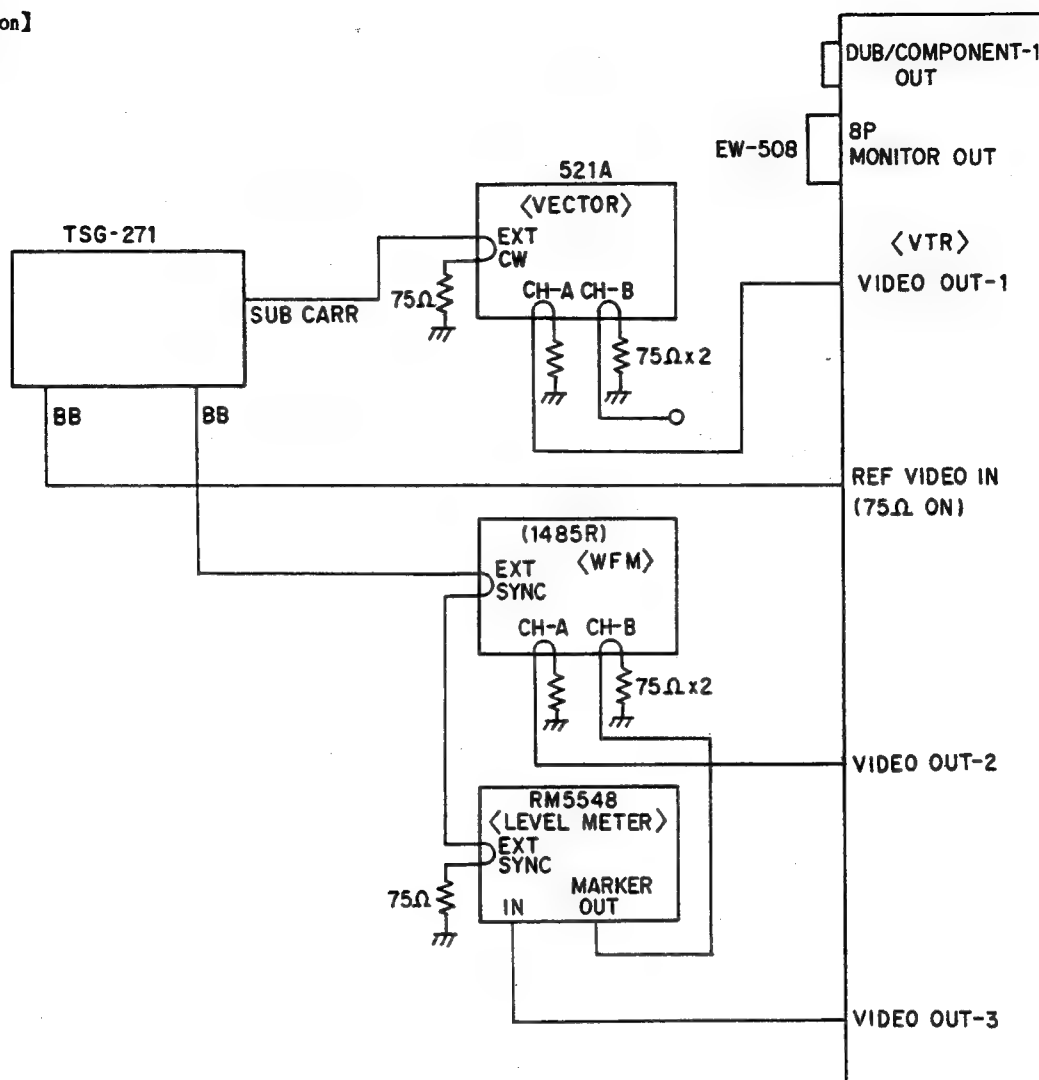
# 12-1-29. C DOC Sensitivity Adjustment

machine conditions for adjustment	specifications	adjustments												
<p>Step 1</p> <ul style="list-style-type: none"><li>• Play back a V locked sweep signal on alignment tape CR5-1B PS.</li><li>• S201-Bit2/DT-13: ON</li><li>• S101-Bit4/SV-82A: ON</li><li>• Turn the TRACKING control so that the output waveform is maximized.</li></ul> <p>• After adjustment is completed, return the above switches to former position.</p>	<p>TP602/DM-56P (F-3)</p>  <p>CH-A/CH-B</p> <table><thead><tr><th>Freq.</th><th>Level</th></tr></thead><tbody><tr><td>2 MHz</td><td>80 ± 20%</td></tr><tr><td>4 MHz</td><td>100 ± 10%</td></tr><tr><td>6 MHz</td><td>100% (Ref.)</td></tr><tr><td>8 MHz</td><td>95 ± 20%</td></tr><tr><td>10 MHz</td><td>75 ± 25%</td></tr></tbody></table>	Freq.	Level	2 MHz	80 ± 20%	4 MHz	100 ± 10%	6 MHz	100% (Ref.)	8 MHz	95 ± 20%	10 MHz	75 ± 25%	<p>●RV601/DM-56P (F-2) (Low range)</p> <p>●RV602/DM-56P (F-2) (High range)</p> <p>TRIG: TP901/DM-56P (C-1) (-): CH-A (+): CH-B</p>
Freq.	Level													
2 MHz	80 ± 20%													
4 MHz	100 ± 10%													
6 MHz	100% (Ref.)													
8 MHz	95 ± 20%													
10 MHz	75 ± 25%													
<p>Step 2</p> <ul style="list-style-type: none"><li>• Play back a pulse &amp; bar signal on alignment tape CR5-2A PS.</li></ul>	<p>TP602/DM-56P (F-3)</p> 	<p>Maximize the DC level using a TRACKING control.</p>												
<p>Step 3</p> <ul style="list-style-type: none"><li>• MODE: JOG STILL</li><li>• When the JOG STILL mode is entered relative to the DC level at TP601/DM-56P (F-2) in the normal PB mode, adjust the DO pulse detection level until the specification is satisfied.</li></ul>	<p>TP601/DM-56P (F-2)</p>  <p>TP603/DM-56P (F-4)</p> <p>5Vdc</p> <p>0Vdc</p> <p>DO PULSE</p> <p>changed</p> <p><math>B/A = 20 \pm 2\%</math></p> <p>(B/A indicates the DO pulse detection level in the JOG STILL mode relative to the DC level at TP601 in the normal PB mode.)</p>	<p>●RV603/DM-56P (F-3)</p> <p>TRIG: TP902/DM-56P (F-1)</p>												

<p>Step 4</p> <ul style="list-style-type: none"> <li>• Play back a flat field signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP602/DM-56P (F-3)</p> 	<p>Maximize the DC level using a TRACKING control.</p>
<p>Step 5</p> <ul style="list-style-type: none"> <li>• MODE: JOG STILL</li> </ul>	<p>TP601/DM-56P (F-2)</p>  <p>TP603/DM-56P (F-4)</p> <p>5Vdc</p> <p>0Vdc</p> <p>DO PULSE</p> <p>changed</p> <p><math>B/A = 16 \pm 2\%</math></p> <p>(B/A indicates the DO pulse detection level in the JOG STILL mode relative to the DC level at TP601 in the normal PB mode.)</p>	<p>RV604/DM-56P (G-3)</p>
<p>Step 6</p> <ul style="list-style-type: none"> <li>• Check that no white noise appears near the guard band on a monitor.</li> </ul>		
<p>Step 7</p> <ul style="list-style-type: none"> <li>• Play back a color-bar with dropout signal on alignment tape CR5-1B PS.</li> </ul>	<p>Check that the dropout portion is compensated on the monitor.</p>	

## 12-2. EN-48P BOARD ADJUSTMENT

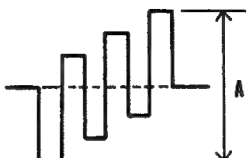
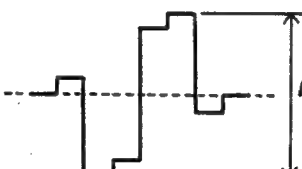
### 【Connection】



### 12-2-1. Clamp Pulse Position Adjustment

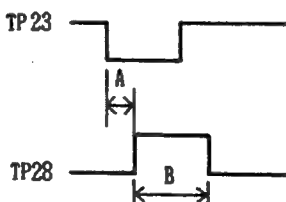
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP29/EN-48P (C-1) TP30/EN-48P (D-1)</p> <p>A = <math>0.8 \pm 0.1 \mu\text{sec}</math> B = <math>1.0 \pm 0.1 \mu\text{sec}</math></p>	<ul style="list-style-type: none"> <li>RV21/EN-48P (D-2)</li> <li>RV22/EN-48P (D-1)</li> </ul>

## 12-2-2. Chroma Input Level Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP3/EN-48P (E-4) (B-Y)</p>  <p><math>A = 0.575 \pm 0.02 V_{p-p}</math></p> <p>TP11/EN-48P (E-5) (R-Y)</p>  <p><math>A = 0.83 \pm 0.02 V_{p-p}</math></p>	<ul style="list-style-type: none"> <li>• B-Y <ul style="list-style-type: none"> <li>⊗RV1/EN-48P (D-5)</li> </ul> </li> <li>• R-Y <ul style="list-style-type: none"> <li>⊗RV5/EN-48P (C-6) (S/N up to 10060)</li> </ul> </li> </ul> <p>TRIG: TP3/EN-48P (E-4) TP11/EN-48P (E-5)</p>

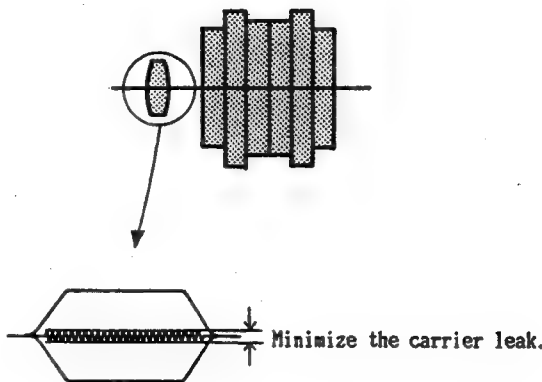
\* After this adjustment is completed, make Sections 12-2-12 COMPONENT 2 R-Y/B-Y OUT Level Adjustment and 12-2-13 DUB C OUT Level Adjustment.

## 12-2-3. Burst Gate Pulse Adjustment

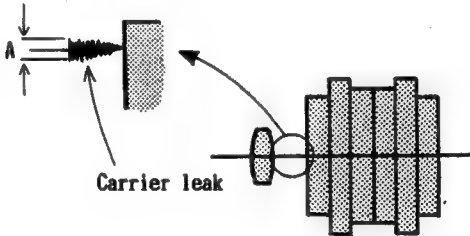
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP23/EN-48P (C-2) TP28/EN-48P (C-1)</p>  <p><math>A = 0.43 \pm 0.01 \mu\text{sec}</math> <math>B = 3.25 \pm 0.05 \mu\text{sec}</math></p>	<ul style="list-style-type: none"> <li>• Position <ul style="list-style-type: none"> <li>⊗RV27/EN-48P (C-1)</li> </ul> </li> <li>• Width <ul style="list-style-type: none"> <li>⊗RV28/EN-48P (D-2)</li> </ul> </li> </ul> <p>TRIG: REF.VIDEO OUT/ connector panel</p>



#### 12-2-4. EN Carrier Leak Adjustment

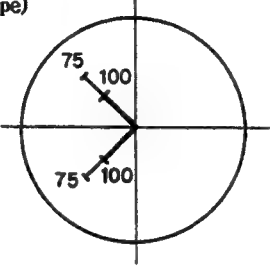
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>• S2/VO-18AP: ON</li> </ul> <p>After adjustment is completed, set S2 on the VO-18AP board to the former position.</p>	<p>VIDEO OUT 2 (Terminated in 75 ohms.) (WFM)</p>  <p>Minimize the carrier leak.</p>	<ul style="list-style-type: none"> <li>• RV502/EN-48P (A-3)</li> <li>• RV602/EN-48P (A-3)</li> </ul> <p>Alternately adjust.</p> <p>TRIG: INT</p>

#### 12-2-5. Chroma Carrier Leak Fine Adjustment

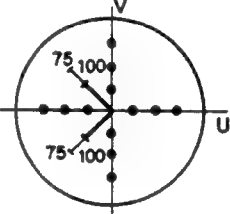
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• S2/VO-18AP: ON</li> <li>• Play back a color-bar signal on alignment tape CR5-1B PS.</li> </ul> <p>After adjustment is completed, set S2 on the VO-18AP board to the former position.</p>	<p>VIDEO OUT 2 (Terminated in 75 ohms.)</p>  <p>Carrier leak</p> <p>Minimize the carrier leak. (<math>A \leq 20 \text{ mVp-p}</math>)</p>	<ul style="list-style-type: none"> <li>• RV6/EN-48P (A-5)</li> <li>• RV2/EN-48P (A-5)</li> </ul> <p>Alternately adjust.</p> <p>TRIG: INT</p>

\* After this adjustment is completed, make Sections 12-2-9, 12-2-10, and 12-2-11.

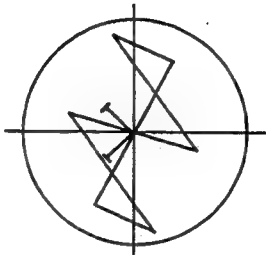


### 12-2-6. Burst Level Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>VIDEO OUT 1 (Terminated in 75 ohms.) (Vectorscope)</p>  <p>Vectorscope</p> <p>Adjust so that the burst signal level is in the vectorscope's luminescent line.</p>	<ul style="list-style-type: none"> <li>RV601/EN-48P (B-3) (S/N up to 10060)</li> <li>RV501/EN-48P (B-3)</li> </ul> <p>TRIG: REF.VIDEO OUT/ connector panel</p>

### 12-2-7. U-V Phase Adjustment

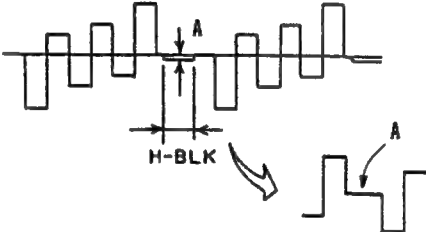
machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>Set the MAX GAIN/75%/100% switch on the vector scope to MAX GAIN.</li> </ul>	<p>VIDEO OUT 1 (Terminated in 75 ohms.) (Vectorscope)</p>  <p>The luminescent spot should be in the center.</p>	<ul style="list-style-type: none"> <li>RV2/EN-48P (A-5)</li> <li>RV6/EN-48P (A-5)</li> </ul> <p>Alternately adjust.</p>
<p>Step 2</p> <ul style="list-style-type: none"> <li>Play back Quad Phase signal on alignment tape CR5-1B PS.</li> <li>Set MAX GAIN/75%/100%/switch on the vector scope to 100%.</li> </ul>	<p>Adjust each dot in the mark "⏏".</p>	<ul style="list-style-type: none"> <li>Adjust so that the dot is in the V axis.</li> <li>RV203/EN-48P (A-2)</li> <li>Adjust so that the dot is in the U axis.</li> <li>RV14 EN-48P (E-4)</li> </ul>

### 12-2-8. Chroma Level Adjustment

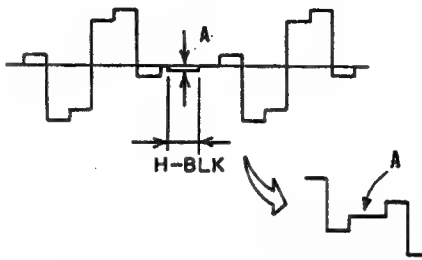
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>VIDEO OUT 1 (Terminated in 75 ohms.) (Vectorscope)</p>  <p>Adjust each dot near the center of [rectangle] .</p>	<ul style="list-style-type: none"> <li>• RV4/EN-48P(A-4)</li> <li>• RV1/EN-48P(C-5)</li> </ul> <p>• Adjustment direction   : RV4   : RV1</p>

\* When RV1 is used in this adjustment, adjust Sections 12-2-12 (only RV34), 12-2-13 (only RV33).

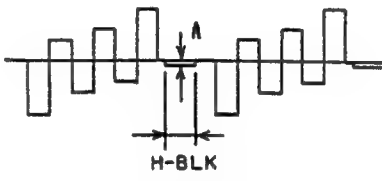
### 12-2-9. COMPONENT 2 B-Y Blanking Level Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>• For this adjustment, never extend the EN-48P board using an extension board.</li> </ul>	<p>COMPONENT 2, B-Y OUT (Terminated in 75 ohms.)</p>  <p>Minimize the blanking level in portion A. (No level difference)</p>	<ul style="list-style-type: none"> <li>• RV30/EN-48P(A-4)</li> </ul> <p>TRIG: REF.VIDEO OUT/ connector panel</p>

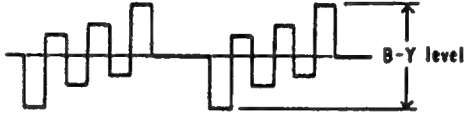
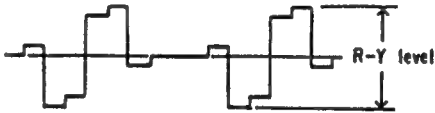
### 12-2-10. COMPONENT 2 R-Y Blanking Level Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>• For this adjustment, never extend the EN-48P board using an extension board.</li> </ul>	<p>COMPONENT 2, R-Y OUT (Terminated in 75 ohms.)</p>  <p>Minimize the blanking level in portion A. (No level difference)</p>	<p>RV40/EN-48P (A-4)</p> <p>TRIG: REF.VIDEO OUT/ connector panel</p>



### 12-2-11. DUB B-Y Blanking Level Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>• For this adjustment, never extend the EN-48P board using an extension board.</li> </ul>	<p>DUB/COMPONENT 1 OUT, pin 5 (Terminated in 75 ohms.)</p>  <p>Minimize the blanking level in portion A. (No level difference)</p>	<p>RV31/EN-48P (A-4)</p> <p>TRIG: REF.VIDEO OUT/ connector panel</p>

# 12-2-12. COMPONENT 2 R-Y/B-Y OUT Level Adjustment

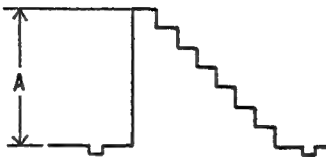
machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bar signal on alignment tape CR5-1B PS.	COMPONENT 2 B-Y OUT (Terminated in 75 ohms.)    $B-Y \text{ level} = 0.7 \pm 0.01 \text{ Vp-p}$	⌚RV34/EN-48P(F-5)
	COMPONENT 2 R-Y OUT (Terminated in 75 ohms.)    $R-Y \text{ level} = 0.7 \pm 0.01 \text{ Vp-p}$	⌚RV41/EN-48P(F-5)  TRIG: REF.VIDEO OUT/ connector panel

# 12-2-13. DUB C OUT Level Adjustment

machine conditions for adjustment	specifications	adjustments
• Play back a 100% color-bar signal on alignment tape CR5-1B PS.	DUB/COMPONENT 1 OUT, pin 3 (Terminated in 75 ohms.)    $R-Y \text{ level} = 0.7 \pm 0.01 \text{ Vp-p}$	⌚RV42/EN-48P(F-5)
	DUB/COMPONENT 1 OUT, pin 5 (Terminated in 75 ohms.)    $B-Y \text{ level} = 0.7 \pm 0.01 \text{ Vp-p}$	⌚RV33/EN-48P(F-4)  TRIG: REF.VIDEO OUT/ connector panel

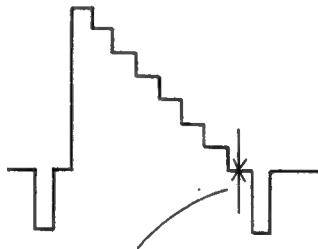
## 12-3. VO-18AP BOARD ADJUSTMENT

### 12-3-1. Input Level Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP2/VO-18AP(C-6)</p>  <p>Level difference between the pedestal level is not contained.</p> <p><math>A = 1.0 \pm 0.02 V_{p-p}</math></p>	<p>RV1/VO-18AP(B-7)</p> <p>TRIG: TP2/VO-18AP(C-6)</p>

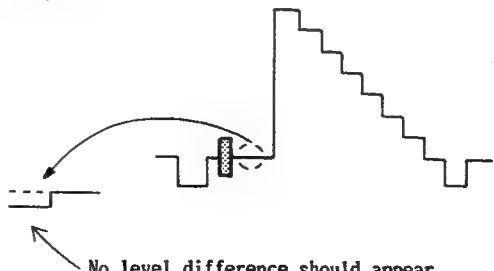
\* After this adjustment is completed, perform Sections 12-3-7 Video output level adjustment and 12-3-8 character Pedestal Adjustment.

### 12-3-2. Y DC Level Adjustment

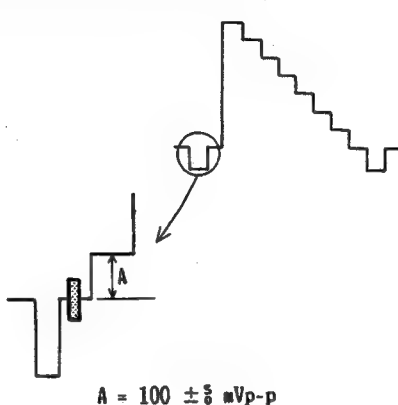
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>• S1/EN-48P: ON</li> <li>• After adjustment is completed, set S1 to the former position.</li> </ul>	<p>TP6/VO-18AP(G-6)</p>  <p>Set the BLACK level to <math>0 \pm 0.01 V_{dc}</math>.</p>	<p>RV7/VO-18AP(F-6)</p> <p>TRIG: TP6/VO-18AP(G-6)</p>

\* After this adjustment is completed, perform Section 12-3-8 Character Pedestal Adjustment.

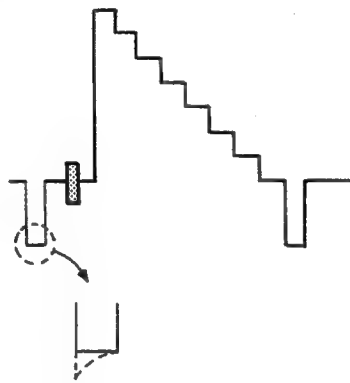
### 12-3-3. Black Level Adjustment (1)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• S1/EN-48P: ON</li> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>• After adjustment is completed, set S1 on the EN-48P board to the former position.</li> </ul>	<p>VIDEO OUT 2 (Terminated in 75 ohms.) (WFM)</p>  <p>No level difference should appear.</p>	<p>RV2/VO-18AP(A-5)</p> <p>TRIG: REF.VIDEO OUT/connector panel</p>

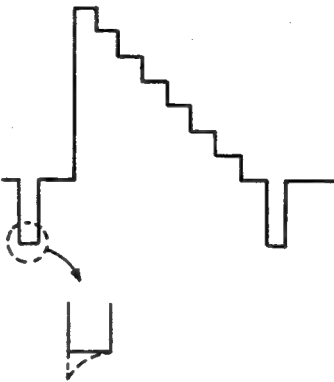
#### 12-3-4. Black Level Adjustment (2)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• BLACK LEVEL PRESET/MANUAL sw: MANUAL</li> <li>• Fully turn the BLACK LEVEL control clockwise.</li> <li>• S1/EN-48P: ON</li> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>• After adjustment is completed, set S1 on the EN-48P board to the former position.</li> </ul>	<p>VIDEO OUT 2 (Terminated in 75 ohms.)</p>  <p><math>A = 100 \pm 5 \text{ mVp-p}</math></p>	<p>RV4/VO-18AP(B-6)</p> <p>TRIG: REF. VIDEO OUT/ connector panel</p>

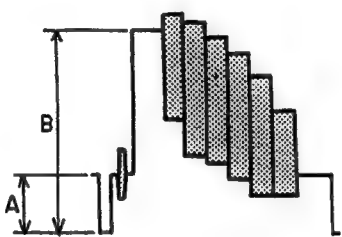
#### 12-3-5. Composite Sync Waveform Shaping Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• S1/EN-48P: ON</li> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>• After adjustment is completed, set S1 on the EN-48P board to the former position.</li> </ul>	<p>VIDEO OUT 2 (Terminated in 75 ohms.) (WFM)</p>  <p>Adjust to be most rectangular.</p>	<p>LV2/VO-18AP(F-5)</p> <p>TRIG: INT</p>

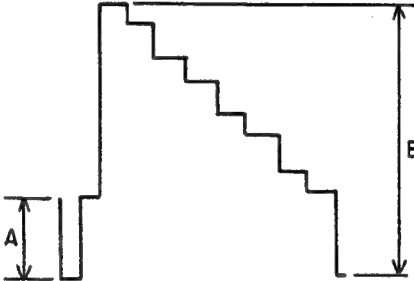
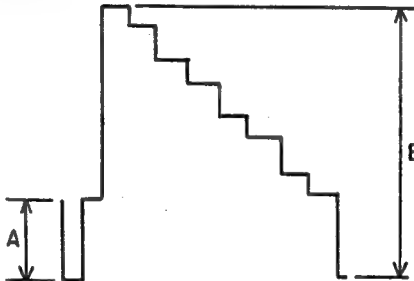
### 12-3-6. Component Sync Waveform Shaping Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• S1/EN-48P: ON</li> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul> <p>• After adjustment is completed, set S1 on the EN-48P board to the former position.</p>	<p>COMPONENT 2 Y OUT (Terminated in 75 ohms.) (WFM)</p>  <p>Adjust to be most rectangular.</p>	<p>● LV1/VO-18AP(E-4)</p> <p>TRIG: INT</p>

### 12-3-7. Video Output Level Adjustment

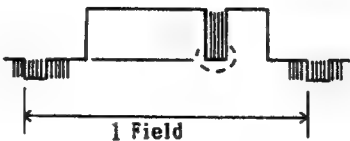
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>Step 1</p> <p>VIDEO OUT 1 (Terminated in 75 ohms.)</p>  <p>A (Sync Level) = <math>0.3 \pm 0.003</math> Vp-p B (Y Level) = <math>1.0 \pm 0.01</math> Vp-p</p>	<ul style="list-style-type: none"> <li>• Sync Level ● RV10/VO-18AP(E-5)</li> <li>• Y Level ● RV5/VO-18AP(E-5)</li> </ul> <p>TRIG: REF.VIDEO OUT/ connector panel</p>
	<p>Step 2</p> <p>VIDEO OUT 2 (Terminated in 75 ohms.)</p> <p>A (Sync Level) = <math>0.3 \pm 0.003</math> Vp-p B (Y Level) = <math>1.0 \pm 0.01</math> Vp-p</p>	<ul style="list-style-type: none"> <li>• Sync Level ● RV16/VO-18AP(F-6)</li> <li>• Y Level ● RV20/VO-18AP(G-6)</li> </ul> <p>TRIG: REF.VIDEO OUT/ connector panel</p>



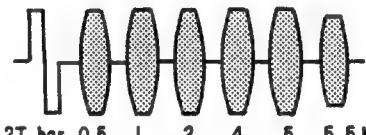
	<p>Step 3 VIDEO OUT 3 (Terminated in 75 ohms.)</p> <p>A (Sync Level) = <math>0.3 \pm 0.003</math> Vp-p B (Y Level) = <math>1.0 \pm 0.01</math> Vp-p</p>	<ul style="list-style-type: none"> <li>• Sync Level RV17/VO-18AP (F-5)</li> <li>• Y Level RV13/VO-18AP (G-5)</li> </ul> <p>TRIG: REF.VIDEO OUT/ connector panel</p>
	<p>Step 4 DUB/COMPONENT 1 OUT (Terminated in 75 ohms.)</p>  <p>A (Sync Level) = <math>0.3 \pm 0.003</math> Vp-p B (Y Level) = <math>1.0 \pm 0.01</math> Vp-p</p>	<ul style="list-style-type: none"> <li>• Sync Level RV11/VO-18AP (E-4)</li> <li>• Y Level RV702/VO-18AP (C-3)</li> </ul> <p>TRIG: REF.VIDEO OUT/ connector panel</p>
	<p>Step 5 COMPONENT 2 Y OUT (Terminated in 75 ohms.)</p>  <p>A (Sync Level) = <math>0.3 \pm 0.003</math> Vp-p B (Y Level) = <math>1.0 \pm 0.01</math> Vp-p</p>	<ul style="list-style-type: none"> <li>• Sync Level RV19/VO-18AP (B-4)</li> <li>• Y Level RV9/VO-18AP (A-4)</li> </ul> <p>TRIG: REF.VIDEO OUT/ connector panel</p>
	<p>Step 6 TP17/VO-18AP (G-5)</p> <p>B (Y Level) = <math>1.0 \pm 0.01</math> Vp-p</p>	<ul style="list-style-type: none"> <li>RV21/VO-18AP (H-4)</li> </ul> <p>TRIG: REF.VIDEO OUT/ connector panel</p>

\* After adjustment in Step 1 is completed, perform Section 12-3-8 Character Pedestal Adjustment.

### 12-3-8. Character Pedestal Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>CHARACTER sw/SY-64AP: ON</li> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>S1/EN-48P: ON</li> <li>S1/VO-18AP: B Black</li> <li>BLACK LEVEL PRESET/MANUAL sw: PRESET</li> </ul>	<p>VIDEO OUT 3 (Terminated in 75 ohms.)</p>  <p>Eliminate the level difference at the pedestal portion.</p> <p>TP17/VO-18AP (G-5)</p> <p>Y Level = <math>0.7 \pm 0.01</math> Vp-p</p>	<p>RV14/VO-18AP (A-6)</p> <p>RV21/VO-18AP (H-4)</p> <p>TRIG: REF.VIDEO OUT/ connector panel</p>
<ul style="list-style-type: none"> <li>After adjustment is completed, set S1 on the EN-48P and VO-18AP boards to the former position.</li> </ul>		

### 12-3-9. Frequency Response Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>S1/EN-48P: ON</li> <li>Play back a multi-burst signal on alignment tape CR5-1B PS.</li> </ul>	<p>CH-1: COMPONENT 2 Y OUT (Terminated in 75 ohms.)</p> <p>CH-2: VIDEO OUT 1 (Terminated in 75 ohms.)</p>  <p>With 100% 2T pulse in COMPONENT 2 Y OUT signal as reference</p> <p>5MHz : <math>98 \pm 6\%</math> (measure peak of moire)</p> <p>5.5MHz: 70% or more (measure center of moire)</p>	<p>CV1/VO-18AP (D-5)</p> <p>TRIG: REF.VIDEO OUT/ connector panel</p>
<ul style="list-style-type: none"> <li>After adjustment is completed, set S1 on the EN-48P board to the former position.</li> </ul>		

## SECTION 13

### TBC ALIGNMENT

#### 【Switch Setting】

##### • Subcontrol Panel

BLACK LEVEL switch : PRESET  
 Y/C DELAY switch : PRESET  
 TBC CONTROL switch : LOCAL  
 VIDEO switch : PRESET

##### • Connector Panel

REF VIDEO 75Ω termination : ON

#### 【Equipment Required】

- Dual-trace oscilloscope
- PAL signal generator (Tektronix 1411 or the equivalent)
- Waveform vector monitor (Tektronix 1751 or the equivalent)
- Frequency counter
- Alignment tape CR5-2A PS or CR5-1B PS

#### CR5-2A PS (8-960-098-44) Contents

TIME min, sec	VIDEO TRACK
0:00	75% Color Bars
3:00	Multi Burst Y: 0.5, 1, 2, 3, 4.1, 4.5 MHz C: 0.2, 0.5, 1, 1.5, 2.0 MHz
6:00	Bowtie & 10T
9:00	Pulse & Bar C: No signal
11:00	Quad Phase
13:00	COMPOSITE Monoscope Video Phase, Diehedral
15:00	

#### CR5-1B PS (8-960-096-91) Contents

TIME min, sec	VIDEO TRACK	AFM
0:00	RF Sweep Marker 1, 2, 4, 6, 8, 10, 12 MHz	No-Signal
2:00	60% H. Sweep (CTDM) Marker 0.5, 1, 2, 3, 4, 5 MHz	
5:00	Pulse & Bar (CTDM)	
8:00	Multi Burst Y: 0.5, 1, 2, 4, 5, 5.5 MHz C: 0.2, 0.5, 1, 1.5, 2 MHz	
11:00	Pulse & Bar	
14:00		400Hz Sine Wave 25kHz Deviation
16:30	100% Color Bars	75kHz Deviation
17:00	50% Bowtie & 10T	No-Signal
19:00	Line 17A Signal	
22:00	Quad Phase	
24:00	Flat Field	
26:00	100% Color Bars with Dropout	
28:00	Composite H. Sweep with VISC	
30:00		

The board name and reference No. in Serial No. 10770 and higher are modified as follows:

S/N	Board	
Up to 10769	TBC-8P	Indicated by (( )).
10770 and higher	TBC-12P	Not indicated by (( )).

【Connection】

Fig. 1

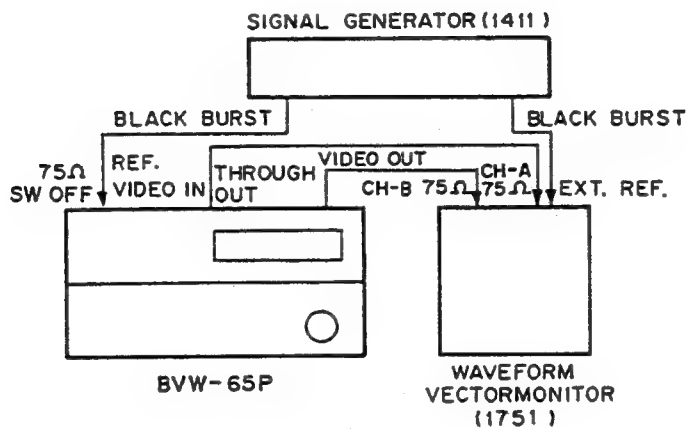
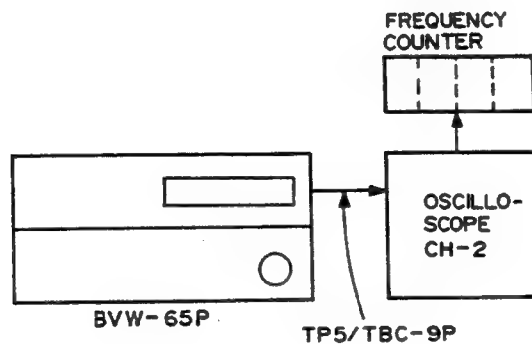
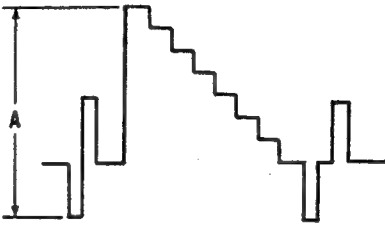


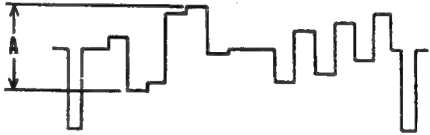
Fig. 2



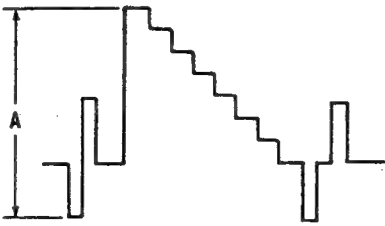
### 13-1. Y-IN CONFIRMATION

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP100/TBC-7P, 7D, 7E (E-1)</p>  <p><math>A = 1.0 \pm 0.05 \text{ V}_{p-p}</math></p>	<p>TRIG: TP100/TBC-7P, 7D, 7E (E-1)</p>


### 13-2. C-IN CONFIRMATION

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP400/TBC-7P, 7D, 7E (E-1)</p>  <p><math>A = 0.85 \pm 0.05 \text{ V}_{p-p}</math></p>	<p>TRIG: TP400/TBC-7P, 7D, 7E (E-1)</p>

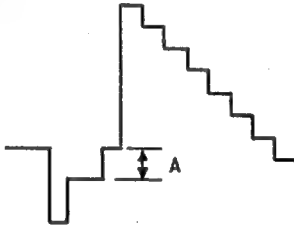
### 13-3. Y-AD IN LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP101/TBC-7P, 7D, 7E (G-2)</p>  <p><math>A = 1.60 \pm 0.05 \text{ V}_{p-p}</math></p>	<p>RV100/TBC-7P, 7D, 7E (F-2)</p> <p>TRIG: TP101/TBC-7P, 7D, 7E (G-2)</p>

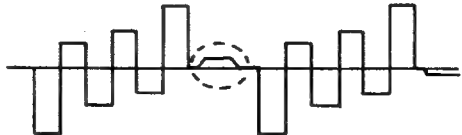
### 13-4. C-AD IN LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP401/TBC-7P, 7D, 7E (C-2)</p>  <p><math>A = 1.75 \pm 0.05 \text{ V}_{p-p}</math></p>	<p>RV400/TBC-7P, 7D, 7E (C-2)</p> <p>TRIG: TP401/TBC-7P, 7D, 7E (C-2)</p>

### 13-5. Y-AD IN PEDESTAL CLAMP ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>Turn S100 on the TBC-7P board to OFF (right side). (Up to S/N 10191)</li> <li>After adjustment is completed, turn S100 on the TBC-7P board to ON (left side).</li> </ul>	<p>TP201/TBC-12P (B-1) ((TP201/TBC-8P (G-1)))</p>  <p><math>A = 0</math></p> <p>No level difference should appear.</p>	<p>RV101/TBC-7P, 7D, 7E (F-2)</p> <p>Turn RV101 clockwise so that the specification is met after it is fully turned counterclockwise.</p> <p>TRIG: TP201/TBC-12P (B-1) ((TP201/TBC-8P (G-1)))</p>

### 13-6. C-AD IN CLAMP LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Turn S400 on the TBC-7P board to OFF (right side). (Up to S/N 10191)</li> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>After adjustment is completed, turn S400 on the TBC-7P board to ON (left side).</li> </ul>	<p>TP501/TBC-12P (A-1) ((TP501/TBC-8P (C-1)))</p>  <p>No level difference should appear.</p>	<p>RV401/TBC-7P, 7D, 7E (C-2)</p> <p>Turn RV401 clockwise so that the specification is met after it is fully turned counterclockwise.</p> <p>TRIG: TP501/TBC-12P (A-1) ((TP501/TBC-8P (C-1)))</p>

### 13-7. Y-NORMAL VCO ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<b>Step 1</b> • Play back a 100% color-bar signal on alignment tape CR5-1B PS. • Supply a black burst signal to the REF VIDEO IN connector.	TP207/TBC-7P, 7D, 7E(J-5)  $A = 2.5 \pm 0.1 \text{ Vdc}$	
<b>Step 2</b>	TP201/TBC-7P, 7D, 7E(H-5)  $B = A \pm 0.1 \text{ Vdc}$  { Make the dc level at TP201 coincide with that at TP207. }	⚙ LV200/TBC-7P, 7D, 7E(H-5)

### 13-8. C-NORMAL VCO ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<b>Step 1</b> • Play back a 100% color-bar signal on alignment tape CR5-1B PS. • Supply a black burst signal to the REF VIDEO IN connector.	TP506/TBC-7P, 7D, 7E(B-6)  $A = 2.5 \pm 0.1 \text{ Vdc}$	
<b>Step 2</b>	TP501/TBC-7P, 7D, 7E(B-5)  $B = A \pm 0.1 \text{ Vdc}$  { Make the dc level at TP501 coincide with that at TP506. }	⚙ LV500/TBC-7P, 7D, 7E(B-5)

### 13-9. Y-WCK FREQUENCY ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• S1/EN-48P: ON (B &amp; W mode)</li> <li>• Play back a 100% color-bar signal with dropout portion on alignment tape CR5-1B PS.</li> </ul> <ul style="list-style-type: none"> <li>• After this adjustment is completed, set S1 to the former position.</li> </ul>	<p>VIDEO OUT Monitor TV</p>	<p>RV201/TBC-7P, 7D, 7E (F-7)</p>

### 13-10. C-WCK FREQUENCY ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• S2/VO-18AP: ON (Y mute)</li> <li>• Play back a 100% color-bar signal with dropout portion on alignment tape CR5-1B PS.</li> </ul> <ul style="list-style-type: none"> <li>• After this adjustment is completed, set S2 to the former position.</li> </ul>	<p>VIDEO OUT Monitor TV</p>	<p>RV501/TBC-7P, 7D, 7E (A-2)</p>



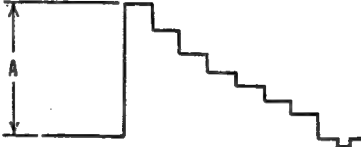
### 13-11. Y-WCK FRB. ERROR VOLTAGE ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• S200/TBC-7P, 7D, 7E: OFF (right side)</li> <li>• S1/EN-48P: ON (B/W mode)</li> <li>• Insert alignment tape CR5-1B PS and play back the color-bar signal into the SEARCH REV <math>\times 24</math> mode.</li> <li>• After adjustment is completed, set S200 on the TBC-7P, 7D, 7E board and S1 on the EN-48P board to the former position.</li> </ul>	<p>TP202/TBC-7P, 7D, 7E(J-7)</p> <p><math>A = 6.0 \pm 0.1 \text{ Vdc}</math></p>	<p>⊗LV201/TBC-7P, 7D, 7E(J-4)</p>

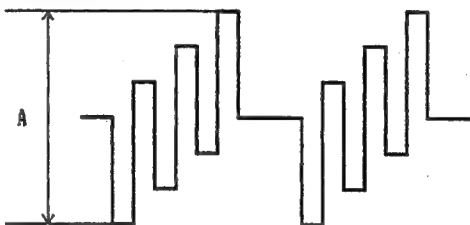
### 13-12. Y-FFB OFFSET ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>• S200/TBC-7P, 7D, 7E: OFF (right side)</li> <li>• S1/EN-48P: ON (B/W mode)</li> <li>• Play back a color-bar signal on alignment tape CR5-1B PS into the SEARCH REV <math>\times 5</math> mode.</li> </ul>	<p>TP202/TBC-7P, 7D, 7E(J-7)</p> <p><math>3.5 \pm 0.1 \text{ Vdc}</math></p>	<p>⊗RV202/TBC-7P, 7D, 7E(J-5)</p>
<p>Step 2</p> <ul style="list-style-type: none"> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS into the SEARCH FWD <math>\times 5</math> mode.</li> <li>• After adjustment is completed, set S200 on the TBC-7P, 7D, 7E board and S1 on the EN-48P board to the former position.</li> </ul>	<p>TP202/TBC-7P, 7D, 7E(J-7)</p> <p><math>7.5 \pm 0.1 \text{ Vdc}</math></p>	<p>⊗RV203/TBC-7P, 7D, 7E(J-6)</p>

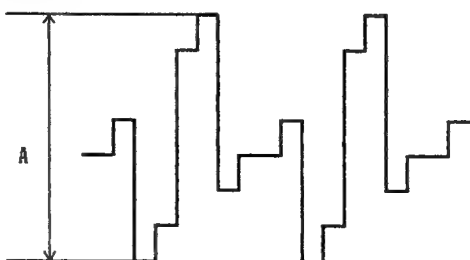
### 13-13. Y LEVEL ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP201/TBC-12P(B-1) ((TP201/TBC-8P(G-1)))</p>  <p><math>A = 1.0 \pm 0.01 V_{p-p}</math></p>	<p>RV200/TBC-12P(E-1) ((RV200/TBC-8P(G-1)))</p> <p>TRIG: TP201/TBC-12P(B-1) ((TP201/TBC-8P(G-1)))</p>

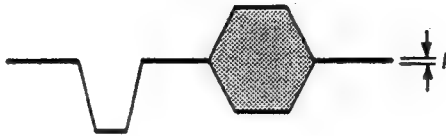
### 13-14. C LEVEL ADJUSTMENT (B-Y)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP501/TBC-12P(A-1) ((TP501/TBC-8P(C-1)))</p>  <p><math>A = 1.2 \pm 0.01 V_{p-p}</math></p>	<p>RV500/TBC-12P(E-1) ((RV500/TBC-8P(F-1)))</p> <p>TRIG: TP501/TBC-12P(A-1) ((TP501/TBC-8P(C-1)))</p>

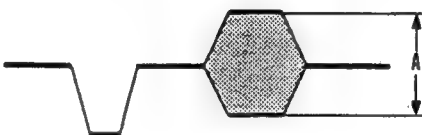
### 13-15. C LEVEL ADJUSTMENT (R-Y)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP503/TBC-12P(B-1) ((TP503/TBC-8P(D-1)))</p>  <p><math>A = 1.2 \pm 0.01 V_{p-p}</math></p>	<p>RV502/TBC-12P(E-1) ((RV502/TBC-8P(F-1)))</p> <p>TRIG: TP503/TBC-12P(B-1) ((TP503/TBC-8P(D-1)))</p>

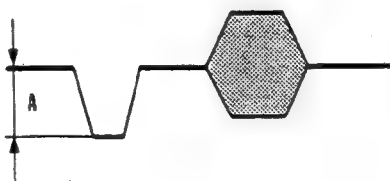
13-16. REF VIDEO OUT CARRIER BALANCE ADJUSTMENT (S/N 10061 and higher)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Supply a black burst signal to the REF VIDEO IN connector.</li> </ul>	<p>VIDEO OUT/connector panel (Terminated in 75 ohms.)</p>  <p>A : Minimize (10 mVp-p or less)</p>	<p>RV8/TBC-9P (D-6)</p> <p>TRIG: VIDEO OUT/ connector panel</p>

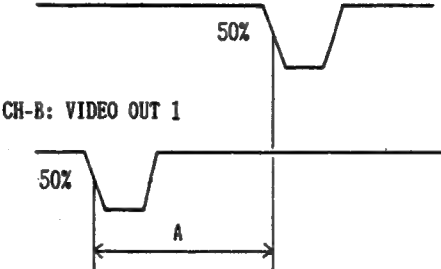
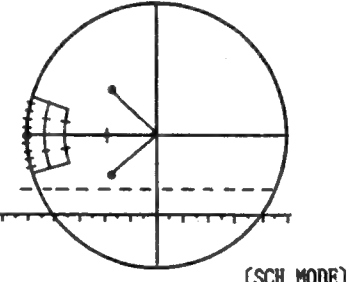
13-17. REF VIDEO OUT BURST LEVEL ADJUSTMENT (S/N 10061 and higher)

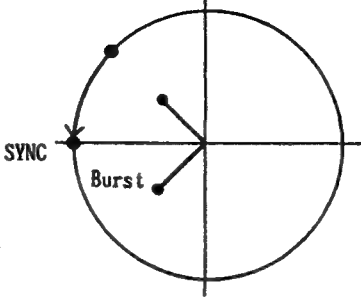
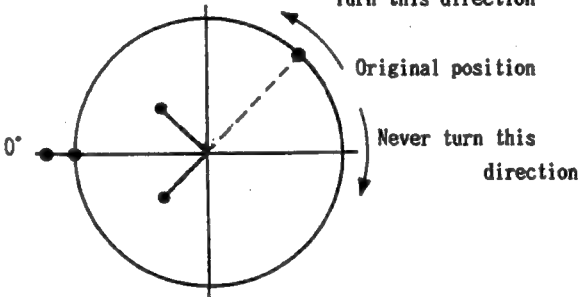
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Supply a black burst signal to the REF VIDEO IN connector.</li> </ul>	<p>VIDEO OUT/connector panel (Terminated in 75 ohms.)</p>  <p>A = <math>300 \pm 20</math> mVp-p</p>	<p>RV9/TBC-9P (D-6)</p> <p>TRIG: VIDEO OUT/ connector panel</p>

13-18. REF VIDEO OUT SYNC LEVEL ADJUSTMENT (S/N 10061 and higher)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Supply a black burst signal to the REF VIDEO IN connector.</li> </ul>	<p>VIDEO OUT/connector panel (Terminated in 75 ohms.)</p>  <p>A = <math>300 \pm 20</math> mVp-p</p>	<p>RV10/TBC-9P (C-7)</p> <p>TRIG: VIDEO OUT/ connector panel</p>

# 13-19. GEN LOCK PHASE ADJUSTMENT

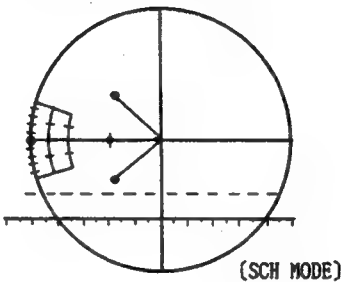
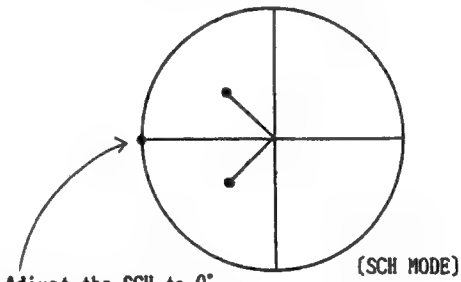
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• CAPSTAN LOCK sw: 2FD</li> <li>• Set the SYNC FINE control on the subcontrol panel to the mechanical center.</li> <li>• Fully turn the SYNC PHASE control on the subcontrol panel to counterclockwise.</li> <li>• CONNECTION: Fig. 1</li> <li>• REF. VIDEO IN 75Ω sw: OFF</li> <li>• Set the EXT REF button of the waveform vector monitor to ON.</li> </ul>	<p>Step 1</p> <p>REF VIDEO THROUGH OUT/connector panel VIDEO OUT 1/connector panel</p> <p>CH-A: REF VIDEO THROUGH OUT</p>  <p><math>A = 3.3 \pm 0.1 \mu\text{sec}</math></p>	<p>ROUGH ADJ.</p> <p>RV2/TBC-9P or 9AP(D-4)</p>
	<p><math>A = 0 \pm 0.1 \mu\text{sec}</math></p>	<p>SYNC PHASE control/ subcontrol panel</p>
<ul style="list-style-type: none"> <li>• Set the waveform vector monitor to SCH mode.</li> </ul>	<p>Step 2</p>  <p>(SCH MODE)</p> <ul style="list-style-type: none"> <li>• Adjust the burst phase of CH-A using the waveform vector monitor's PHASE control, and adjust the burst phase of CH-B using the subcontrol panel's SC control.</li> </ul>	

<ul style="list-style-type: none"> <li>• Disconnect the signal from REF. VIDEO IN connector.</li> <li>• Set the waveform vector monitor to INT REF. mode.</li> <li>• Adjust the burst phase using the waveform vector monitor's PHASE control.</li> </ul>	<p>Step 3</p>  <p>• Adjust the SYNC phase.</p>	<p>● SYNC FINE control/ subcontrol panel</p>
<ul style="list-style-type: none"> <li>• Supply a black burst signal to REF. VIDEO IN connector.</li> <li>• Set the waveform vector monitor to EXT REF. mode.</li> </ul>	<p>• Adjust the burst phase using the waveform vector monitor's PHASE control as the same manner in Step 2.</p>	
	 <p>(SCH: 0° )</p>	<p>● RV2/TBC-9P or 9AP(D-4)</p>

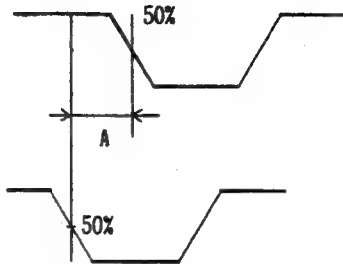
### 13-20. INT SUBCARRIER FREQUENCY ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Set the REF VIDEO IN connector to OPEN.</li> <li>• CONNECTION: Fig. 2</li> </ul>	<p>TP5/TBC-9P or 9AP(B-5)</p> <p>SC frequency <math>4,433,619 \pm 10 \text{ Hz}</math></p>	<p>● RV1/TBC-9P or 9AP(D-5)</p>

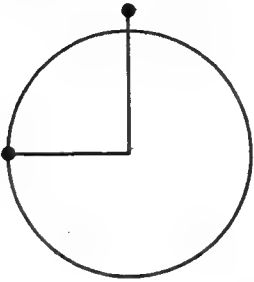
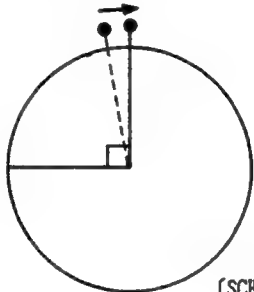
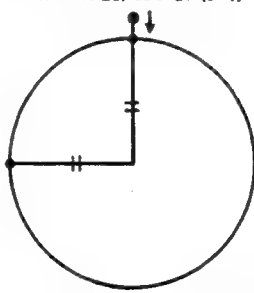
13-21. INT SUBCARRIER PHASE ADJUSTMENT (S/N 10061 and higher)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Set the REF VIDEO IN connector to OPEN.</li> <li>Terminate the waveform vector monitor's CH-A in 75 ohms and set the EXT REF button to INT.</li> </ul>	<p>Step 1</p> <p>CH-A : TP10/TBC-9P (D-7)</p>  <p>(SCH MODE)</p> <ul style="list-style-type: none"> <li>Adjust the burst phase using the waveform vector monitor's PHASE control.</li> </ul>	
	<p>Step 2</p> <p>CH-A : TP10/TBC-9P (D-7)</p>  <p>Adjust the SCH to 0°</p> <p>(SCH MODE)</p> <ul style="list-style-type: none"> <li>Adjust the SCH's luminance spot according to the specification.</li> </ul>	<p>RV4/TBC-9P (E-5)</p>

# 13-22. SV SYNC ADJUSTMENT

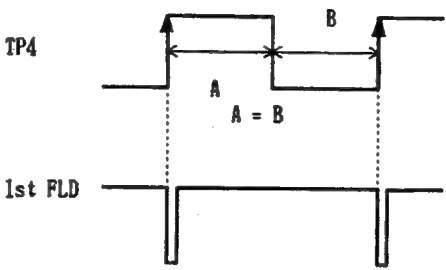
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Supply a black burst signal to the REF VIDEO IN connector.</li> </ul>	<p>TP7/TBC-9P or 9AP(B-6)</p>  <p>TP1/TBC-9P or 9AP(D-5)</p> <p><math>A = 1.04 \pm 0.04 \mu\text{sec}</math></p>	<p>RV3/TBC-9P or 9AP(C-4)</p> <p>TRIG: TP1/TBC-9P or 9AP(D-5)</p>

# 13-23. REF VIDEO BURST PHASE/BALANCE ADJUSTMENT (S/N 10061 and higher)


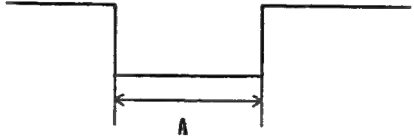
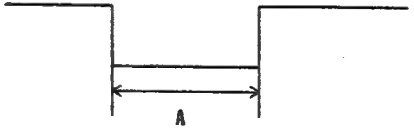
machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>REF VIDEO IN 75 <math>\Omega</math> sw: OFF</li> <li>Terminate the waveform vector monitor CH-A in 75 ohms and set the VECT <math>\times 5</math> mode.</li> <li>CONNECTION: Fig. 1</li> <li>Shift the burst to 45° using a PHASE control on a vectorscope.</li> <li>Set the GAIN to UNCAL mode and adjust the burst phase on a circumference.</li> </ul>	<p>CH-A : TP10/TBC-9P (D-7)</p>  <p>(SCH MODE)</p> <p>Adjust the burst phase using the waveform vector monitor's PHASE control and remove the SCH error using the signal generator's HORIZ. DELAY VR.</p>	
<p>Step 2</p>	<p>CH-A : TP10/TBC-9P (D-7)</p>  <p>(SCH MODE)</p>	<p>RV7/TBC-9P (C-5)</p>
<p>Step 3</p>	<p>CH-A : TP10/TBC-9P (D-7)</p>  <p>(SCH MODE)</p>	<p>RV6/TBC-9P (C-5)</p>









### 13-24. REF 1st FIELD ADJUSTMENT

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Supply a black burst signal to the REF VIDEO IN connector.</li> <li>MODE: EE</li> </ul>	<p>CH-1: TP4/TBC-9P or 9AP(C-4) CH-2: 1st FLD/1411</p>  <p>Adjust the 1st FLD pulse so that appears at the rising edge of TP4.</p>	<p>RV12/TBC-9P or 9AP(C-4)</p>

### 13-25. COUNT H POSITION ADJUSTMENT (Up to S/N 11425)

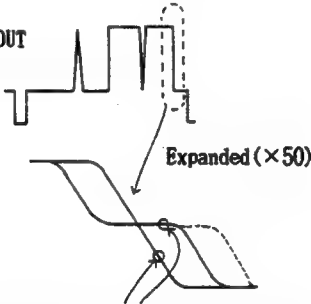
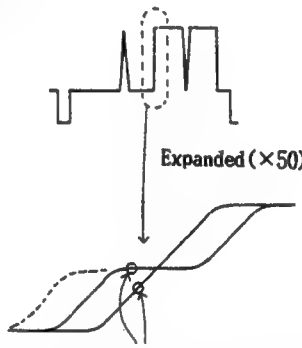
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Set RV303 on the SY-64AP board (G-5) to the mechanical center position, and RV304 on the SY-64AP board (G-6) to the following figure position.</li> </ul>  <ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>TP309/SY-64AP(F-4)</p>  <p><math>A = 10 \pm 1 \mu\text{sec}</math></p>	<p>RV305/SY-64AP(G-5)</p> <p>TRIG: INT</p>
	<p>IC6 pin 6(H-6) or IC25 pin 12(E-5)/SY-64AP</p>  <p><math>A = 12 \pm 1 \mu\text{sec}</math></p>	<p>RV399/SY-64AP(G-5)</p> <p>TRIG: INT</p>

# 13-26. IMPACT ERROR OUTPUT LEVEL ADJUSTMENT (Up to S/N 11425)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Check that RV303 on the SY-64AP board (G-5) is set to the mechanical center position and that RV304 on the SY-64AP board (G-6) is set to the figure position below.</li> </ul>  <ul style="list-style-type: none"> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> <li>Turn S301 (H-8) or S302 (G-8) on the SY-64AP board ON and OFF.</li> </ul>	<p>TP306/SY-64AP (G-6) (GND: E4/SY-64AP (I-6))</p> <p>S301: OFF</p>  <p>S301: ON</p>  <p><math>B/A &lt; 1/4</math></p>	<p>RV303/SY-64AP (G-5)</p> <p>Generally, RV303 is set to the mechanical center position.</p>
	<p>TP307/SY-64AP (G-7) (GND: E4/SY-64AP (I-6))</p> <p>S302: OFF</p>  <p>S302: ON</p>  <p><math>D/C &lt; 1/3</math></p>	<p>RV304/SY-64AP (G-6)</p> <p>Generally, RV304 is set to the figure position below.</p> 

### 13-27. NOISE REDUCTION PULSE ADJUSTMENT

- Before performing this adjustment, use tapes aligned by the BVW-75P.
- INPUT SELECT sw: COMPOSITE
- Supply a pulse & bar signal (-1.5dB) to the BVW-75P's VIDEO IN connector.
- Record the pulse & bar signal.

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back the pulse &amp; bar signal that is recorded on tape by BVW-75P as mentioned above.</li> </ul>	<p>Step 1 COMPONENT 2 Y OUT</p>  <p>Expanded (×50)</p> <p>The luminance in two lines should be the same.</p>	<ul style="list-style-type: none"> <li>●RV852/DEC-39A (B-2)</li> <li>●RV202/DEC-46AP (B-6)</li> </ul> <p>Short between TP702 on the NR-32 ((NR-25)) board and GND.</p> <p>TRIG: TG55BX SYNC</p>
	<p>Step 2 COMPONENT 2 Y OUT</p>  <p>Expanded (×50)</p> <p>The luminance in two lines should be the same.</p>	<ul style="list-style-type: none"> <li>●RV851/DEC-39A (B-2)</li> <li>●RV201/DEC-46AP (B-5)</li> </ul> <p>TRIG: TG55BX SYNC</p>



## SECTION 14

### OVERALL VIDEO ALIGNMENT

The board name and reference No. in Serial No. 10770 and higher are modified as follows:

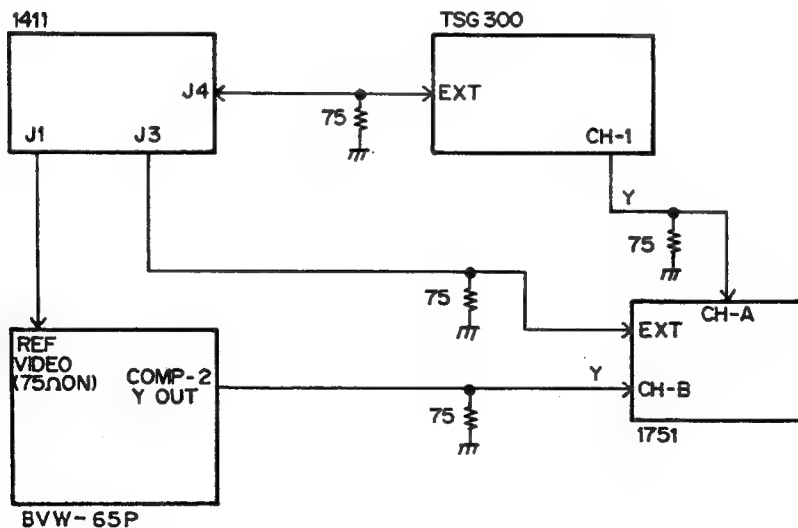
S/N	Board	
Up to 10769	TBC-7P TBC-8P	Indicated by (( )).
10770 and higher	TBC-7D,7E TBC-12P	Not indicated by (( )).

#### Adjustment during Board Replacement

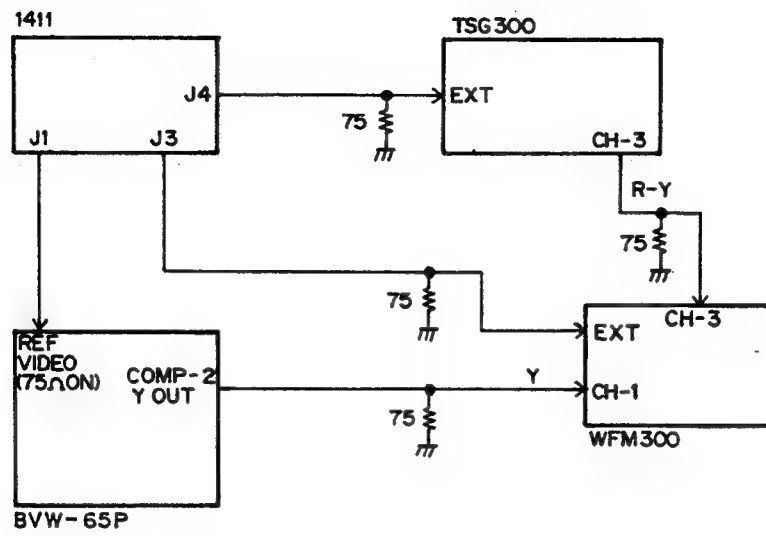
- (a) When replacing the TBC-7D,7E and TBC-12P boards at the same time, adjust from Section 14-1.
- (b) When replacing only the defective TBC-7D,7E board, directly adjust from Section 14-2.
- (c) When replacing only the defective TBC-12P board, directly adjust from Section 14-2.
  - For Step 3 in Section 14-2-1, however, adjust using RV702 (C-3) on the NR-32 board instead of RV200 on the TBC-7D,7E board.
  - For Section 14-3-1, adjust using RV701 (C-3) on the NR-32 board instead of RV500 on the TBC-7D,7E board.
  - RV501 on the TBC-12P board can be used for adjustment as it is.

#### 14-1. VIDEO PHASE, Y/C DELAY, C/C DELAY ADJUSTMENTS (USING SIGNAL GENERATOR, SG-161 (J-6336-170-A))

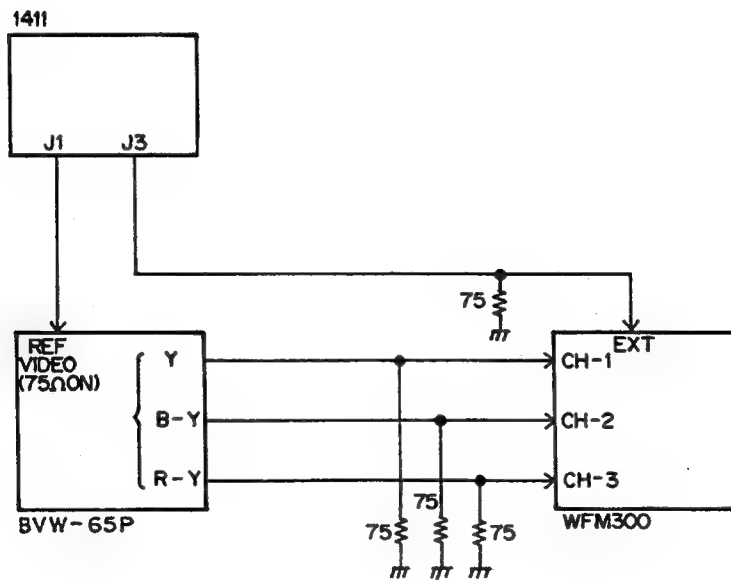
【Connection 1】


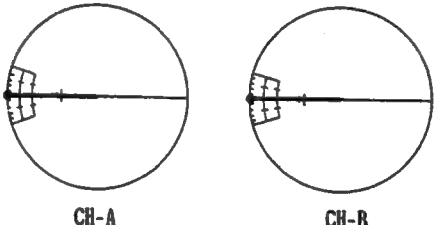


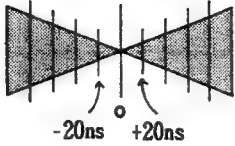
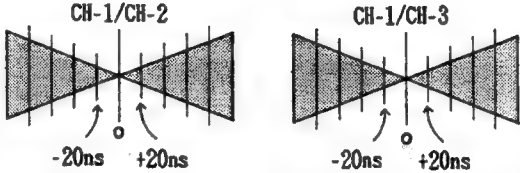
【Connection 2】



【Connection 3】



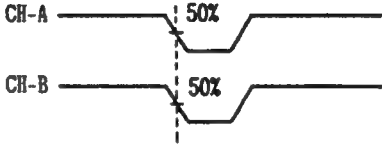
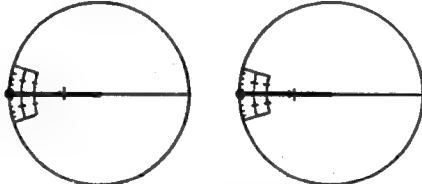
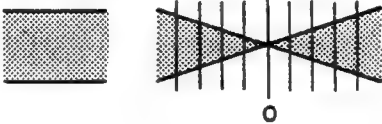
machine conditions for adjustment	specifications	adjustments
<b>Step 1</b> • Remove the TBC-7D, 7E and TBC-12P boards.		
<b>Step 2</b> • Insert extension board the SG-161 into the TBC-12P board position and plug the TBC-12P board onto it. • Connection 1.		
<b>Step 3</b>	Adjust so that the phase at the trailing edge of a CH-A sync signal coincides with that of a CH-B sync signal. COMPONENT 2 Y OUT/connector panel (WFM MODE/WAVEFORM VECTOR MONITOR)  	SYNC controls/subcontrol panel (FINE: mechanical center)
	Adjust so that the CH-A sync phase coincides with the CH-B sync phase. (SCH MODE/WAVEFORM VECTOR MONITOR)  	• CH-A PHASE control/waveform vector monitor • CH-B SYNC (FINE) controls/sub-control panel
Put the Tektronix 1751 again into the WFM mode.	Check that the phase at the trailing edge of CH-A and CH-B sync signals are not shifted.  Note: The Tektronix 1751 should be used in the EXT TRIG mode.	

<p>Step 4</p> <ul style="list-style-type: none"> <li>Put the TSG300 and WFM300 into the BOWTIME mode in connection 2.</li> </ul>	<p>Adjust the dip point to the center marker. (0 <math>\pm</math> 10nsec)</p> 	<p>RV702/NR-32(C-3)</p>
<p>Step 5</p> <ul style="list-style-type: none"> <li>Put the WFM300 into the BOWTIE mode in connection 3.</li> <li>Y/C DELAY adjustment</li> </ul>	<p>Adjust the bowtie signal's dip point on the left of the WFM300 to the center marker. (0 <math>\pm</math> 10nsec)</p> 	<p>RV701/NR-32(C-3)</p>
<p>Step 6</p> <ul style="list-style-type: none"> <li>Remove extension board the SG-161 and insert the TBC-7D, 7E and TBC-12P boards into the previous position.</li> </ul>		



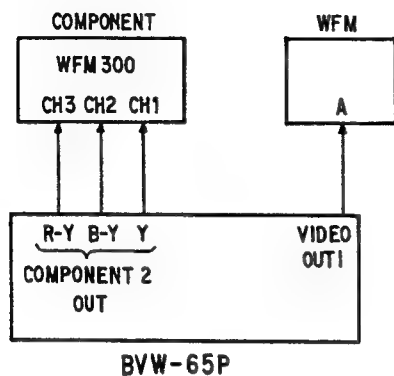
## 14-2. VIDEO PHASE ADJUSTMENT

### 14-2-1. PB Component Video Phase Adjustment

machine conditions for adjustment	specifications	adjustments
<b>Step 1</b> • Play back a 50% bowtie & 10T signal on alignment tape CR5-1B PS.	<b>COMPONENT 2 Y OUT/connector panel</b> <b>(WFM MODE/WAVEFORM VECTOR MONITOR)</b>  <p>Align the sync phase in CH-A and CH-B is in phase.</p>	<b>SYNC controls/subcontrol panel</b> <b>(FINE control: mechanical center)</b>  <b>TRIG: EXT MODE/WAVEFORM VECTOR MONITOR</b>
<b>Step 2</b> • Play back a 50% bowtie & 10T signal on alignment tape CR5-1B PS.	<b>COMPONENT 2 Y OUT/connector panel</b> <b>(SCH MODE/WAVEFORM VECTOR MONITOR)</b>  <p>Align the sync phase in CH-B with that in CH-A.</p>	• CH-A <b>PHASE control/waveform vector monitor</b> • CH-B <b>SYNC (FINE) controls/subcontrol panel</b>  <b>RV200/TBC-7P, 7D, 7E (J-3)</b>
<b>Step 3</b> • Connect the R-Y terminal of WFM to R-Y signal of signal generator.	<b>COMPONENT 2 Y OUT/connector panel</b> <b>(BOWTIE MODE/WFM 300)</b>  <p>Adjust the dip point to the center marker.  <math>(0 \pm 10 \text{ nsec})</math></p>	<b>TRIG: EXT/WFM</b>

### 14-3. Y/C, C/C DELAY ADJUSTMENT

#### [Connection]



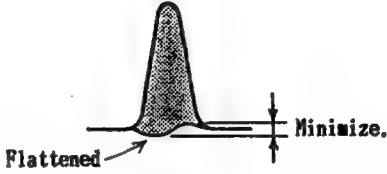
#### 14-3-1. PB Component, Y/C, C/C Delay Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a 50% bowtie &amp; 10T signal on alignment tape CR5-1B PS.</li> <li>• CHROMA sw/subcontrol panel: MANUAL</li> <li>• After adjustment is completed, set CHROMA switch to the PRESET position.</li> </ul>	<p>COMPONENT 2/connector panel (BOWTIE MODE/COMPONENT WFM)</p> <p>CH-1/CH-2      0ns      CH-1/CH-3      0ns</p> <p>Adjust the dip point to the center marker. (0 ± 10 nsec)</p>	<ul style="list-style-type: none"> <li>●RV500/TBC-7D, 7E (C-7)</li> <li>((●RV500/TBC-7P (D-6)))</li> <li>●RV501/TBC-12P (D-1)</li> <li>((●RV501/TBC-8P (F-1)))</li> </ul> <p>CHROMA control/ subcontrol panel</p> <p>TRIG: INT/COMPONENT WFM</p>

#### 14-3-2. PB Composite Y/C Delay Adjustment (Metal)

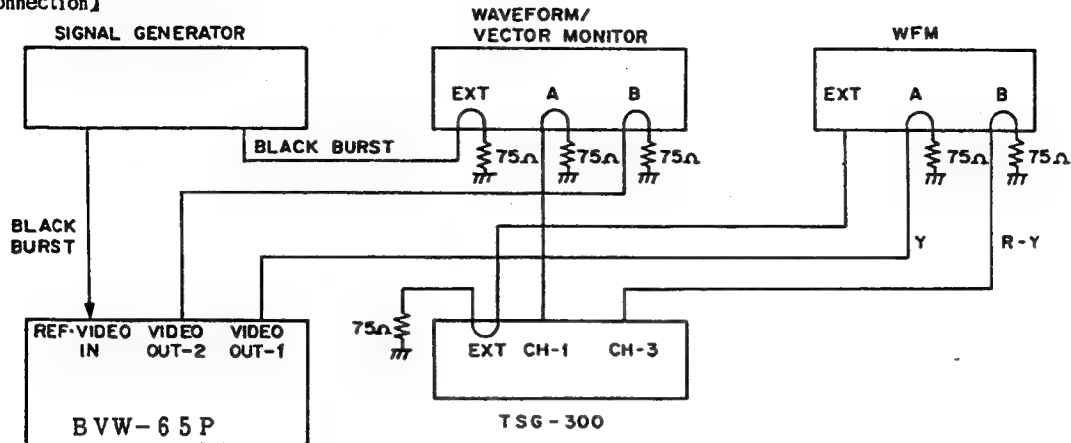
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a pulse &amp; bar signal on alignment tape CR5-1B PS.</li> <li>• CHROMA sw/subcontrol panel: MANUAL</li> <li>• After adjustment is completed, set CHROMA switch to the PRESET position.</li> </ul>	<p>VIDEO OUT 1/connector panel</p> <p>Adjust the 10T portion to flat by the CHROMA control on the subcontrol panel.</p>	<ul style="list-style-type: none"> <li>●RV350/EN-48P (B-4)</li> </ul> <p>CHROMA control/ subcontrol panel</p> <p>TRIG: INT/WFM</p>

# 14-3-3. PB Composite Y/C Delay Adjustment (Oxide)

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Play back a pulse &amp; bar signal on alignment tape CR5-2A PS.</li> <li>• CHROMA sw/subcontrol panel: MANUAL</li> <li>• After adjustment is completed, set CHROMA switch to the PRESET position.</li> </ul>	<p>VIDEO OUT 1/connector panel</p> 	<p>RV503/TBC-7P, 7D, 7E (C-6)</p> <p>TRIG: INT/WFM</p>

# 14-3-4. PB Composite Sync Phase Adjustment

## [Connection]

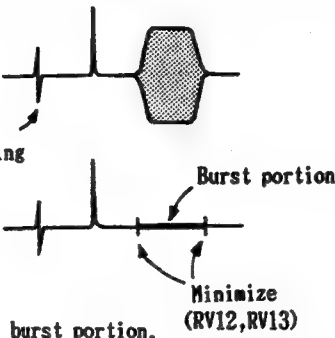


Note: The signal generator's SCH should be  $0 \pm 2^\circ$ .

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>S1/EN-48P(A-3): ON</li> <li>Play back a bowtie signal on alignment tape CR5-1B PS.</li> </ul>	<p>Step 1</p> <p>VIDEO OUT 1/connector panel (A-B MODE/WFM)</p> <p>CH-1/CH-3</p> <p>Adjust the dip point to the center marker. (<math>0 \pm 10</math> nsec)</p>	<p>SYNC FINE control.</p> <p>TRIG: EXT MODE/WFM</p>
	<p>Step 2</p> <p>VIDEO OUT 2/connector panel (WFM MODE/WAVEFORM VECTOR MONITOR)</p> <p>CH-A</p> <p>CH-B</p> <p>Align the sync phase in CH-A and CH-B is in phase.</p> <p>VIDEO OUT 2/connector panel (Terminated in 75 ohms.) (SCH MODE/WAVEFORM VECTOR MONITOR)</p> <p>CH-A</p> <p>CH-B</p> <p>Align the sync phase in CH-B with that in CH-A. At that time, check that the phase shown above is in phase.</p>	<p>RV15/VO-18AP (C-4)</p> <ul style="list-style-type: none"> <li>CH-A PHASE control/waveform vector monitor</li> <li>CH-B SYNC (FINE) control/sub-control panel</li> </ul> <p>TRIG: EXT MODE/WAVEFORM VECTOR MONITOR</p>

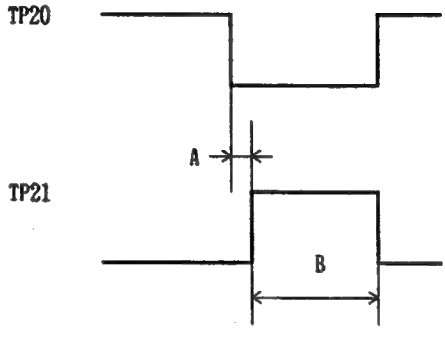
After adjustment is completed, set S1 on the EN-48P(A-3) board to the former position.

### 14-3-5. Burst Position Adjustment

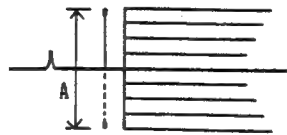
machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>• Supply a black burst signal to the REF. VIDEO IN connector.</li> <li>• Connect the REF. VIDEO through OUT of the unit to WFM, and VIDEO OUT 1 to WFM.</li> <li>• Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul>	<p>VIDEO OUT 1/connector panel (Terminated in 75 ohms.) (A-B MODE/WFM)</p>  <p>Minimize the falling edge of sync.</p> <p>Burst portion</p> <p>Minimize (RV12, RV13)</p> <p>Minimize the burst portion.</p>	<ul style="list-style-type: none"> <li>• SYNC SYNC control, FINE control/subcontrol panel</li> <li>• BURST SC control/subcontrol panel</li> </ul> <p>TRIG: INT/WFM</p>
<p>Step 2</p>	<p>Minimize the output level before and behind the burst.</p>	<p>RV12/EN-48P (D-2)</p> <p>RV13/EN-48P (D-2)</p>

## 14-4. PB COLOR FRAMING ADJUSTMENT

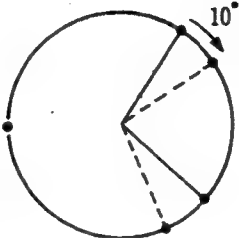
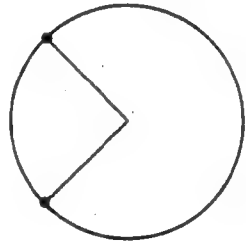
### 14-4-1. ID Mix Pulse Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Supply a black burst signal to the REF. VIDEO IN connector.</li> <li>CAPSTAN LOCK sw: 8FD</li> <li>S1 and S2/EN-48P: ON</li> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul> <p>After adjustment is completed, set S1 and S2 to the former positions.</p>	<p>TP20/EN-48P (E-2) TP21/EN-48P (D-2)</p>  <p><math>A = 8 \pm 1 \mu\text{sec}</math> <math>B = 55 \pm 1 \mu\text{sec}</math></p>	<p>RV25/EN-48P (F-2) RV26/EN-48P (F-2)</p> <p>TRIG: TP20/EN-48P (E-2)</p>

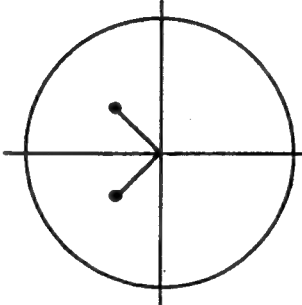
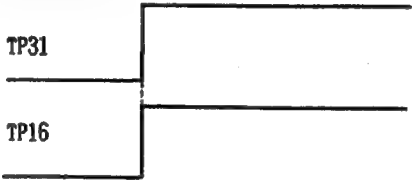
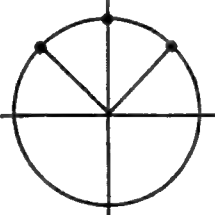
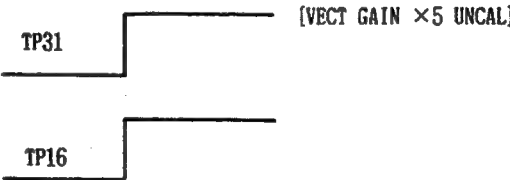
### 14-4-2. Chroma ID Level Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>CAPSTAN LOCK sw: 8FD</li> <li>S1/EN-48P(A-3): ON</li> <li>Play back a 100% color-bar signal on alignment tape CR5-1B PS.</li> </ul> <p>After adjustment is completed, set the CAPSTAN LOCK sw to 2FD and reset S1/EN-48P to the former position.</p>	<p>DUB/COMPONENT 1 B-Y OUT/connector panel (WFM)</p>  <p><math>A = 0.525 \pm 0.02 \text{ V}_{p-p}</math></p>	RV36/EN-48P (E-5)
	<p>COMPONENT 2 B-Y OUT/connector panel</p> <p><math>A = 0.525 \pm 0.02 \text{ V}_{p-p}</math></p>	RV35/EN-48P (F-5)

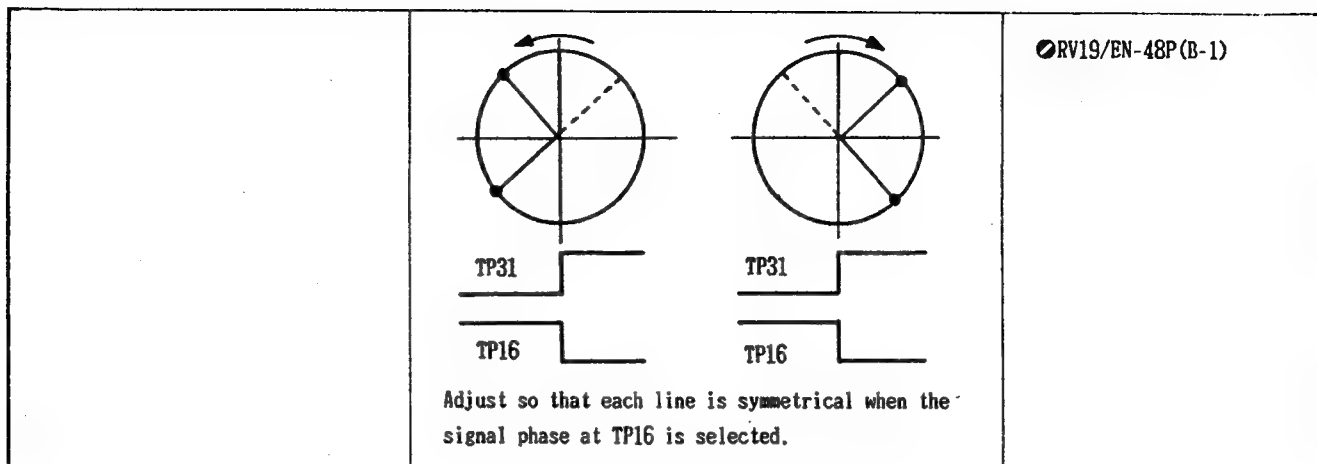
### 14-4-3. SC Phase Adjustment

machine conditions for adjustment	specifications	adjustments
<p>Step 1</p> <ul style="list-style-type: none"> <li>Supply a black burst signal to the REF. VIDEO IN connector.</li> <li>Set the burst phase on the circumference in GAIN <math>\times 5</math> and UNCAL modes.</li> <li>Fully turn the SC control on the subcontrol panel and RV17 on the EN-48P board counterclockwise.</li> <li>Using RV17 on the EN-48P board, preset to the position in which the burst is locked.</li> </ul>	<p>VIDEO OUT 1 connector (Terminated in 75 ohms.)</p>  <p>Delay the burst by 10 degrees using RV17 on the EN-48P board by turning it clockwise.</p>	<p>RV17/EN-48P (D-1)</p>
<p>Step 2</p> <ul style="list-style-type: none"> <li>Turn the SC control to measure the SC phase variable range.</li> </ul>	<p>The control change should be 360° or more.</p> 	<p>SC control/subcontrol panel</p>

#### 14-4-4. Encoder Field Pulse Adjustment

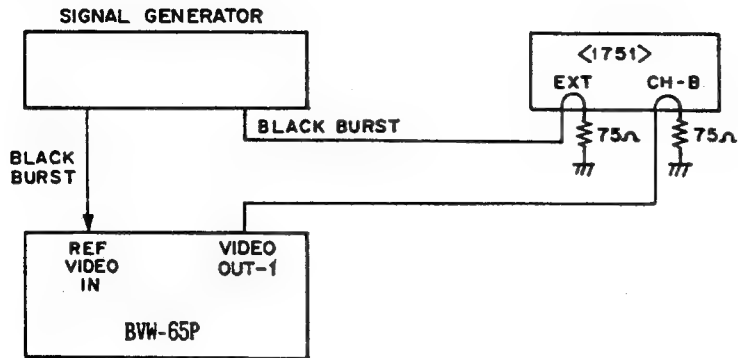
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• CAPSTAN LOCK sw: 2FD</li> <li>• Play back a 100% color-bar signal on alignment tape CRS-1B PS.</li> </ul>	VIDEO OUT 1/connector panel   Adjust the burst phase and sync phase.	<ul style="list-style-type: none"> <li>• Burst SC control/subcontrol panel</li> <li>• Sync SYNC FINE control/subcontrol panel</li> </ul>
	TP16/EN-48P(A-2) TP31/EN-48P(F-4)   Align the phase.	ROUGH ADJ. ⚙️RV19/EN-48P(B-1)
	  [VECT GAIN X5 UNCAL]	PHASE control/waveform vector monitor






# 14-4-5. SCH OUT LED Adjustment

【Connection】



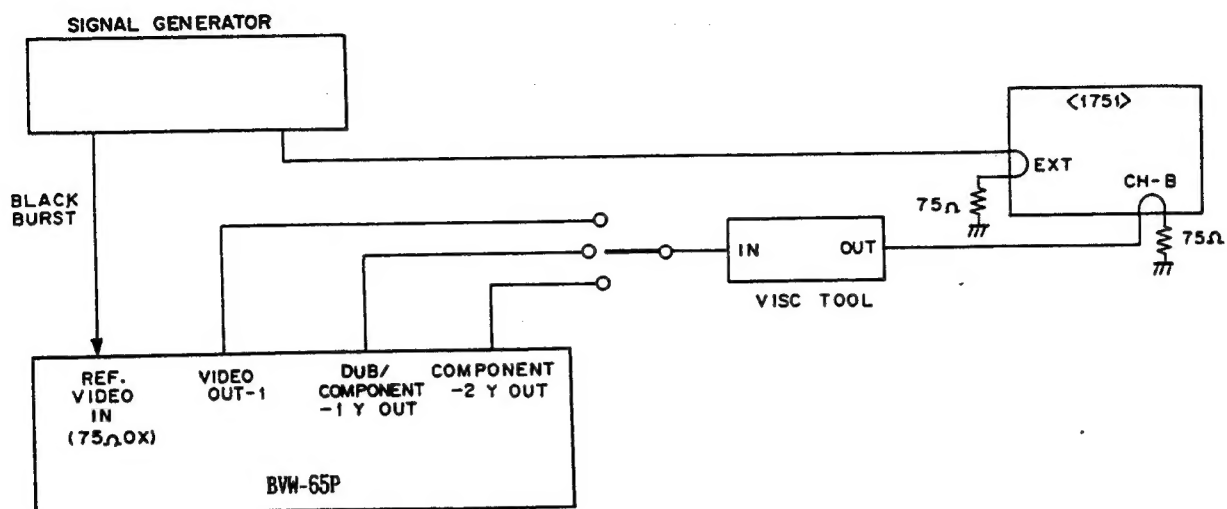
machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Supply a black burst signal to the REF. VIDEO IN connector.</li> <li>CAPSTAN LOCK sw: 2FD</li> <li>Adjust the burst phase on the circumference in GAIN <math>\times 5</math> and UNCAL mode.</li> </ul>	<p>VIDEO OUT 1/connector panel (SCH MODE/WAVEFORM VECTOR MONITOR)</p> <p>SCH = 0°</p> <p>When SCH is in the range shown above, the SCH OUT lights.</p>	<p>SYNC FINE control and SC control/subcontrol panel</p>
	<p>+40 <math>\pm</math> 10°      -40 <math>\pm</math> 10°</p> <p>Adjust so that the LED lights in the above range.</p>	<p>RV20/EN-48P (C-2) SC control/subcontrol panel</p> <p>TRIG: EXT/WAVEFORM VECTOR MONITOR</p>

# 14-4-6. REGEN. VISC Level Adjustment

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Supply a black burst signal to the REF. VIDEO IN connector.</li> <li>CAPSTAN LOCK sw: 8RD</li> <li>S101/TBC-7P,7D,7E: ON</li> <li>S500-Bit4/TBC-12P/8P: ON</li> <li>S4, S5/VO-18AP: ON</li> <li>S4-Bit 8/TBC-9P/9AP: ON</li> <li>Play back a composite H sweep signal with VISC on alignment tape CR5-1B PS.</li> </ul>	<p>Step 1 DUB/COMPONENT 1 OUT, pin 1 (Terminated in 75 ohms.) WAVEFORM MODE (LINE SELECTOR: LINE 8)</p>  <p>A (SETUP level) = <math>350 \pm 5</math> mVp-p B (VISC level) = <math>300 \pm 5</math> mVp-p</p>	<ul style="list-style-type: none"> <li>SETUP level RV701/VO-18AP(A-3)</li> <li>VISC level RV700/VO-18AP(A-3)</li> </ul> <p>TRIG: REF.VIDEO OUT/ connector panel</p>
<ul style="list-style-type: none"> <li>After adjustment is completed, return the above switches to former position.</li> </ul>	<p>Step 2 (S/N 10061 and higher) COMPONENT 2 Y OUT</p> <p>B (VISC level) = <math>300 \pm 5</math> mVp-p A (SETUP level) = <math>350 \pm 5</math> mVp-p</p>	<ul style="list-style-type: none"> <li>VISC level RV703/VO-18AP(A-3)</li> <li>SETUP level RV704/VO-18AP(B-3)</li> </ul>

## 14-5. VISC ADJUSTMENT

[Connection]



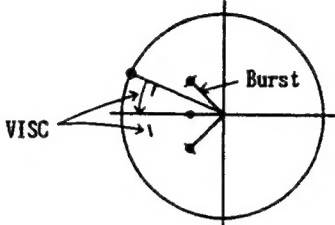
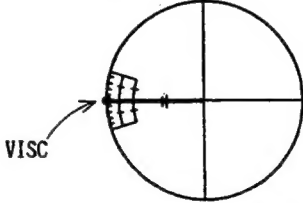
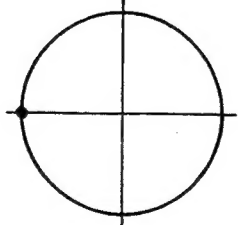
### 14-5-1. VISC Duty Adjustment

Input/output SCH should be 0°.

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>Supply a black burst signal to the REF. VIDEO IN connector.</li> <li>CAPSTAN LOCK sw: 8FD</li> <li>After adjustment is completed, set CAPSTAN LOCK switch to 2FD.</li> </ul>	<p>TP701/EN-48P(F-2)</p> <p>A = B</p>	<p>RV703/EN-48P(G-1)</p> <p>TRIG: TP701/EN-48P(F-2)</p>

# 14-5-2. VISC Phase Adjustment

Input/output SCH should be 0° .

machine conditions for adjustment	specifications	adjustments
<ul style="list-style-type: none"> <li>• Supply a black burst signal to the REF. VIDEO IN connector.</li> <li>• CAPSTAN LOCK sw: 8FD</li> <li>• S3-Bit 1 to Bit 8/TBC-9P or 9AP: OFF</li> <li>• S4-Bit 1 to S4-Bit 7/TBC-9P or 9AP: OFF</li> <li>• S500-Bit 4/TBC-12P/8P: ON</li> <li>• S4-Bit 8/TBC-9P or 9AP: ON</li> <li>• S101/TBC-7P, 7D, 7E: ON</li> <li>• S4/VO-18AP: OFF</li> <li>• S1/EN-48P: ON</li> <li>• Play back a composite H sweep signal with VISC signal on alignment tape CR5-1B PS.</li> </ul>	<p>VIDEO OUT 1 through VISC tool</p> <p>Step 1 VECTOR MODE (LINE SELECTOR: LINE 8)</p> <p>Set SCH to 0° .</p>  <p>Set the burst to the burst axis on the vectorscope.</p>	<p>PHASE control</p> <p>SC control and SYNC FINE control/subcontrol panel</p> <p>RV701/EN-48P(G-1)</p> <p>TRIG: INT/WAVEFORM VECTOR MONITOR</p>
	<p>Step 2 DUB/COMPONENT 1 Y OUT through VISC tool VECTORSCOPE MODE/WAVEFORM VECTOR MONITOR (LINE SELECTOR: LINE 8)</p>  <p>Set the VISC to 180° .</p>	<p>PHASE control/ WAVEFORM VECTOR MONITOR</p>
<ul style="list-style-type: none"> <li>• S4/VO-18AP: ON</li> <li>• After adjustment is completed, set the switches to the former position.</li> </ul>	<p>Step 3</p>  <p>Set the VISC to 180° .</p>	<p>RV702/EN-48P(G-1)</p> <p>TRIG: EXT/WAVEFORM VECTOR MONITOR</p>

